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INSTITUTION NOTICES.

List of Lectures as far as arranged to the end of the Season.

WEDNESDAY, June 3rd. Professor LAMBERT, Royal Naval College, Greenwich, on
“Sounding Machines for the Prevention of Stranding, with special reference to
James’ Sub-Marine Sentry.”

FRIDAY, June 5th. Lieut.-Colonel E. T. HUTTON, Commandant The Mounted
Infantry Regiment, D.A.A.G., Aldershot, on “The Mounted Infantry
Question in its relation to the Volunteer Force of Great Britain.”

FRIDAY, June 12th. Commander T. A. HULL, R.N., on “The handicraft of
Navigation, and on Nautical Surveying.”

FRIDAY, June 19th. Rear-Admiral P. H. COLOMB, on “Principles of retirement in
the Services.”

FRIDAY, June 26th. Lieut.-General Sir W. F. DRUMMOND JERVOIS, G.C.M.G.,
C.B., &c., on “The Supremacy of the Navy for Imperial defence.”

FRIDAY, July 3rd. Professor VIVIAN B. LEWES, Royal Naval College, Greenwich,
on “The storage of smokeless powders on board Her Majesty’s Ships.”

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I.P.T.O.

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The Journal OF THE Royal United Service Institution.

VOL. XXXV.

JUNE, 1891.

No. 160.

[Monthly Issue.]

Friday, April 17, 1891.

GENERAL SIR ARTHUR J. HERBERT, K.C.B., in the Chair.

I. THE RANKS COMPARED WITH CIVILIAN WORKING-
CLASS LIFE.—II. RECRUITING DIFFICULTIES.—III.
THE CONDITION OF THE ARMY RESERVE.¹

By Colonel F. J. GRAVES, 20th Hussars.

I.

In May last year I read a paper here on "Cavalry Equipment, Organization, and Distribution," in which I touched upon the Reserve question, and at the close of the discussion several of the Council asked me to prepare a paper on the basis of my remarks, and to include the subject of Recruiting.

The subject comprised in the three heads of my paper to-day has, during the past year, occupied the public mind to an extraordinary extent; the principal papers have had leading articles, and many magazines have had contributions from able pens and influential sources: this theatre and the lecture room of the Aldershot Military Society have been the arenas of animated and useful discussions on no less useful lectures delivered by Officers who have studied the subject. So much has been said and written on this important subject, that I hesitated long before deciding to appear before you to-day, but I do so for two reasons: first, because I think a great deal of uncalled-for "stale fish" has been cried concerning our soldiers and the general conditions of life in the ranks; secondly, because, for the purpose of comparison between these conditions and those obtaining in the ranks of the wage-earning population, I have had opportunities of study and of gaining information that seldom fall to the lot

¹ The publication of this lecture has been unavoidably delayed.—ED.

of an Officer on full pay. There is scarcely a staple trade of our country the conditions and circumstances of which I have not studied, and with the wage-earning workers of which I have not mixed. My opportunities have been as varied as the classes with which I have come in contact, from the huge mass meeting of thousands of artisans at a Church Congress to a dozen or more in the common room of a tramps' and thieves' lodging in a filthy slum.

With regard to the soldier of the present day, it is said that he compares unfavourably with those of days gone by. I am bound to admit that great numbers of our recruits are too young, and that at certain periods of pressing need many are enlisted that do not fulfil the conditions and physical requirements of their calling. I admit that the present soldier compares unfavourably with the past chiefly in the matter, the important matter, of age. Colonel G. M. Onslow, no mean authority, thinks that the physique of the present is up to the standard of the past.

Compared with the recruits of Continental armies ours, even now, compare favourably. In Austria, France, Germany, and Russia the minimum age is 20 years; minimum height ranges from 5 feet $\frac{1}{4}$ inch to 5 feet $1\frac{1}{2}$ inches; chest measurement from "no limit" to 30·8 inches. In this kingdom the limits are 18 years; 5 feet 4 inches height; and chest 33 inches. With us, the age in the ranks among men of first period runs from 18 to 25 years; in the above armies, not beyond 23 as a rule. The latter have the advantages of being, as a rule, better nourished and educated before joining. As to crime and drunkenness, there is less now than ever there was in our Army.

In education vast strides have been made. In matters of sanitation, except in one or two notorious instances, our men's conditions of life compare favourably with those of any of the civilian classes of unskilled labour, and with many of the skilled.

As to cleanliness, they compare favourably with any ordinary wage-earning class.

The result of above facts, as well as other causes not named, is, that in times of peace the rate of mortality among soldiers in this kingdom is lower than that of any ordinary working class, agriculturists possibly excepted.

The comparison with foreign armies is truly astonishing. The report of Dr. Corput, an official of the Belgian Government, states the death-rate for last year in the German Army as 3·97 per cent.; in French, 6; Belgian, 4·07; Austria, 6·94; in this kingdom, 0·86.

It should also be remembered, when comparing the present soldier with the past, that in times of need, such as 1812 and 1858, the minimum height with us was 5 feet 3 inches, and in 1859 the chest limit went down to 33 inches. Further, that in one period of six years under the old system, i.e., ending 1865, an average of 5,000 men per annum were discharged to modified pension as unfit for further service, the majority of whom had less than six years' service, and that during the same period the average annual "wanting to complete" establishment was 4,500.

So much for the recruit as he is. Let us examine his position as a wage-earner compared with his civilian brother.

My endeavour will be to prove that, for a man of his age and inches and average intellectual qualifications, he is better off than almost any class of unskilled wage-earner in civil life, and further, that without the above reservation as to physique, &c., he on enlistment has better prospects in his calling of advancement than almost any civilian wage-earner, skilled or unskilled.

First, he receives in the cavalry clothing and underclothing valued at 12*l.* 4*s.* 2*d.* free; then year by year he receives clothing, &c., valued at 4*l.* 0*s.* 8*½d.*

His weekly wage in money and in kind I consider is as follows:

	Cavalry. £ s. d.	Infantry. £ s. d.
Money	0 8 2	0 7 0
Bread and meat	0 3 6	0 3 6
Clothing	0 1 6	0 1 0
Coal and light.....	0 2 4	0 2 4
Lodging	0 2 4	0 2 4
	£0 17 10	0 16 2

To this must be added value of, or the interest on value of, furniture, bed, bedding, cleaning utensils, cooking utensils, tables, forms, shelves, fire-irons, coal boxes, cans, brushes, &c., the washing of his bedding, his rates, taxes, and water, and medical attendance, added to which he has the services of a comrade to cook his food, free. I think I am within the mark when I put the value of foregoing at at least another 1*s.* per week, bringing up the total to 18*s.* 10*d.* per week, or, including deferred pay, exactly 1*l.* in cavalry and 17*s.* 4*d.* in infantry.

On the other hand, the cavalry soldier has to pay out of his 21*l.* 5*s.* 6*d.* cash received annually for groceries, washing, hair cutting, repairs to clothing, &c., replacing necessaries, his share of barrack damages, library, &c., a sum which, when every necessary of life has been supplied him and paid for, leaves him 4*s.* to 5*s.* 6*d.* per week to spend on luxuries. I would ask what class of unskilled labourers have such a weekly balance to waste or save?

Further, he is assured of constant employment; no change of weather can rob him of his daily bread—no slackness of trade lowers his wage. Is this true of civil life? No! He is paid sick or well, on duty or on furlough; he travels single fare for the double journey, as also do his wife and children if he has such. He gets a higher rate of interest in his regimental savings-bank than his civilian brother can obtain, and has the use of canteen, coffee shop, and recreation accommodation of a useful if not high class; he has free education as well.

The foregoing are his present-tense privileges from the day he joins.

Before stating the conditions obtaining in several callings in civil life I would like to draw your special attention to one important fact in favour of the soldier as compared with the civilian. His sole qualifications for employment are his physique and his apparent mental capacity, his moral worth does not enter the question as a rule.

In choosing certain callings in civil life for the purposes of comparison, I have, with one exception, selected those which have occupied the public mind to a great degree recently. First, then, the economical status of the agricultural labourer has been the cause of considerable anxiety and discussion. The ordinary farm hand earns a weekly wage ranging from 7s. per week in Wiltshire, as General Dunne informed us the other day here, to 16s. in some more favoured districts. I believe the average is about 12s. 6d. per week, out of which he has to find shelter, food, clothing, fuel, and light, and all the necessities of life for himself and, as often as not, for his wife and family.

He also subscribes, as a rule, to a sick club, and to a union. He must have a fairly good character before he is taken on. He must be able-bodied. His hours are long and his work is laborious. His employment is not constant. When sick his place is filled up, and, as a rule, he has no work in hard weather beyond occasional "odd jobs." In his case, then, meat is not an article of daily consumption, and is almost a luxury. Further, he has to pay for the education of his children.

The proof that life, or existence, under the foregoing conditions is considered hard, and that the occupation is thought unprofitable, lies in the fact that great and increasing numbers of the agricultural population have been and are migrating to the cities and towns in the hope, too often vain, of bettering themselves. I do not think it requires any argument to show that the soldier is better off than "Hodge."

The Scotch railway strikes which caused so much anxiety and inconvenience to the public, as well as misery and want to the strikers, led me to inquire into the conditions of life among railway porters. On one important line the ordinary porter's weekly wage is 15s., rising 1s. per annum to 18s., the limit. They must be 5 feet 7 inches in height and 37 inches chest measurement. The average age on joining is nineteen. They must have a good character, and they must be members of a sick benefit club. When sick, their places are kept open for them fourteen days only. They receive uniform coats, cap, waistcoats, and trousers. Their hours are long, their work hard and often dangerous.

I maintain that (except the last point) the soldier's lot compares most favourably on every point of comparison with the railway porter's.

Allow me now to take an indoor calling.

As I write I have before me an advertisement from a West-end registry office asking for candidates of good character for thirty-four vacancies for footmen, mostly in West-end of London, wages ranging from 16*l.* to 35*l.* per annum.

I have also before me particulars as to the male servants employed in one of the clubs to which I belong. The average age is twenty-five years, average weekly wage is 14s. The limits are 18*l.* to 40*l.* per annum, exclusive of men in superior position. They receive livery, board and lodging, and, when sick, their places are kept open fourteen days.

Here good character is essential, also presentable appearance, smartness, also technical knowledge—all antecedent to obtaining employment at above wages. Here employment depends on health. Here the man has to save for the bad times of old age or idleness. If married, he has to provide and maintain a separate establishment. I consider that in some ways the soldier's lot compares favourably with the footman's, though perhaps not in all.

I now pass to a very different stratum of life, or rather existence. Having lived for five years in Staffordshire I can endorse every word of the testimony which was discussed in the House of Commons recently, concerning the nail and chain makers of that and the neighbouring county, which I now present to you. Mr. Burnett, the Labour Correspondent of the Board of Trade, in his Report of 1888, on above trades, shows that mothers, for a pittance of 4*s.* or 5*s.* a week, do the work of slaves on a Cuban plantation. The men are "born to be nailers, to blow huge bellows, and operate ten to thirty pound weight olivers from morning till night, to be skinny, wan, flat-chested, to breathe fetid air, to account butcher's meat once a week a luxury, and to be deafened with a perpetual babel of rasping sounds. . . . That is their fate. . . . For twelve hours' work a day a chain-maker may expect to gain 10*s.* to 11*s.* a week. . . . On this a household can afford to live in a ruined hovel, amid filth, on water gruel."

I shall not waste time in comparing the lot of the soldier with the nail and chain-maker as above authoritatively described, nor will I ask you to follow me into the "Sweater's den," nor to the so-called "home" of the miserable creature who slaves under the iron heel of this the most ghastly oppression that has ever disgraced our country and our common humanity.

There is one more class to be touched upon before I proceed to consider my second point.

The greatest mass of centralized yet unorganized unskilled labour is to be found in East London and at the docks. Two members of the State Colonization Association went to these docks on a certain day and there saw, as Lord Meath describes it, "thousands of half-starved men struggle and fight, aye, literally fight like wild animals, scrambling over the heads of one another and trampling each other down in their efforts to attract the attention of the foreman whose business it is to engage the hands for the day."

What is the pay?—5*d.* an hour. It sounds good; but Dr. Ogle's Blue Book states that the docker's average earnings in work is 17*s.* per week. This does not sound bad, but mark! "55 per cent. of the whole number were out of work when the Return was made, and

80 per cent. had been out of work for some time during the four previous months."

The Report of the Mansion House Committee on Metropolitan Distress shows that an average of 8,000 men are turned away daily from the dock gates of London.

In an article entitled, "The Dock Life of East London," published in the "Nineteenth Century," in 1887, it is stated that 13 per cent. of the entire Tower Hamlets population lived below the line of decent life; 22 per cent. on the line of poverty, and "all alike are subject to the physically deteriorating and morally brutalizing conditions which are described. . . . There is a movement downward in the grades of labour. Permanent men are being everywhere dismissed, while preference men are becoming mere casuals. And yet, in spite of this steady shrinkage of employment, we have an increasing drift of low class labour into London."

Here again, I think comparison is needless. Such are the conditions morally, physically, and economically of the classes referred to. What are their prospects? What prospects has the agricultural labourer? At most, a bare subsistence in his old age, most often helped out by aid from children and parish relief; failing these, the union and a pauper's grave. What are the prospects of the chain-maker? A squalid existence, ending in a premature old age of mental and physical decrepitude, from which death is a relief. What those of the sweater's slave and the docker? In too many cases a sure and almost inevitable downward gradation to a level "below that of decency," to a condition of semi-destitution and consequent despair, and many to be merged in the ranks of the pauper, vagrant, and criminal classes.

I have shown what I believe the soldier to be, and what he has on joining. What, then, are his prospects while serving? I say *while serving*. Beyond constant employment, he has the benefit of continued education in Army schools, good-conduct pay, money prizes for proficiency with arms, extra pay for extra employment, ranging from 4*d.* to 1*s.* per day. In my regiment there are 152 privates thus paid, and a total of 175 non-commissioned officers and men are employed and receive extra pay for work involving technical instruction. Married soldiers have furnished quarters; their wives earn washing money; families have medical treatment and education free. There are 34,000 positions of non-commission rank, extra paid, open to the soldier; he has the prospect of deferred pay and pension. There are 1,073 posts, held by warrant, open to soldiers. There are 604 commissions, as Quartermasters and Riding Masters, held by soldiers so promoted, and a certain number receive commissions in the ordinary combatant ranks.

I look upon the soldier's work, generally speaking, after he has settled down, as no more than healthy exercise. I think I have shown that it, and the general conditions of his calling, produce good health and long life, and that a good soldier enjoys emoluments, has privileges and prospects of advancement that compare most favourably with those open to his brothers of the wage-earning population.

II. Recruiting Difficulties.

Among recruiting difficulties to be faced and overcome, I think that of longest standing is the deep-rooted prejudice among the respectable working classes against soldiering as a calling. To "go for a soldier," and "to go to the dogs," mean the same thing to a large proportion of this class.

Popular prejudice is a dogged foe, and holds out against argument and the logic of demonstrated fact longer than any other. Yet, one must trust, that in time, the steady raising and improving of the soldier's condition, morally, educationally, economically, and, therefore, socially, will have their effect. The fact of the great decrease of crime and drunkenness, and the consequent closing of several military prisons for want of occupants, must tell favourably. The fact that the soldier is better educated and better looked after now than formerly must produce effect in the desired direction. The increasing number of counter-attractions to the low class public-houses, &c., &c., in and out of barracks, in the way of soldiers' institutes and similar places of recreation, must raise the soldier's character in proportion as they are used by him in his spare time.

That the above-named prejudice is breaking down may, in a measure, be proved by the following comparison:—In the 10 years from 1860 to 1869, under the old system, an average of 21,500 men offered their services as soldiers; in the 10 years, 1880 to 1889, the average rose to 58,000. In 1886 the number was actually 75,000.

It may sound a strange doctrine, but I think that the so-called education now in vogue in our Board and other schools is becoming an increasing difficulty in the way of recruiting. I draw a broad distinction between "schooling" and "education;" the schooling now received engenders a distaste for manual labour and for soldiering. The clever, sharp lad, who has a bold adventurous spirit, leaves the plough or the spade, and "goes to town" to seek work as a clerk. The town artisan's son, who can write a good hand and book-keep, despairs the hammer, and becomes a clerk or shopman.

The writer of "Darkest England" says, ". . . another great evil is the extent to which our education tends to overstock the labour market with material for quill-drivers and shopmen, and gives our youth a distaste for sturdy labour." One example of this: At a registry office one clerkship and one post as carpenter were advertised on the same day; terms offered, 22s. and 25s. per week, respectively; the total applications for the clerkship were 200, and for the other only two!!

The effect of education in this direction on the classes from which our recruits are drawn can only be gauged by a knowledge of the vast strides made in this century. In 1800 there was a total of 3,363 registered schools, in 1866 there were 8,763, in which there were taught 1,082,055 pupils; in 1882 there were 21,362 schools and 3,436,416 pupils. Now there are over 4,000,000 pupils, and over 4,000,000*l.* spent on education, whereas, in 1830, the Government grant

in aid amounted to but 20,000*l.* Owing to above tendency the cost of skilled labour has so advanced that few skilled labourers of good character will enlist, and the unskilled beginner who sticks to his work and improves, hopes, in time, to earn the higher wage of the skilled, so he is loth "to go for a soldier."

Another very important difficulty in the way of recruiting is the spirit of unrest that pervades the wage-earning population of our times. Speaking of the old days, Mr. A. Forbes says, "There were no professional agitators in those days, nor any barrack-room lawyers who 'knew their rights,' there was not a great deal of that commodity of a little of which the poet speaks as a 'dangerous thing,' and there were no halfpenny newspapers." Of the present, he says, "This is the era of agitation, upheaval, restlessness, strike, and caprice." The truth of this cannot be questioned. There is abroad a spirit of rebellion against restraint, authority, and contract. Men don't like to be tied down or to bind themselves for a long period. This spirit pervades the many. On the other hand, there are some who desire a settlement, they want "fixity of tenure" in their employment, but they look on the Army as only a temporary means of livelihood, they see in it no assurance for the future. Of this more further on.

Another difficulty lies, I think, in the want of full and exact information as to his life, pay, and prospects on the part of the recruit. He is told on enlisting that he will be "all found," and get 1*s.* a day. He finds on joining that he is not "all found," and that he does not receive 1*s.* per day, for out of that 1*s.* per day he has to "find himself" in certain things of which he was given no idea before joining. Hence he starts with rankling discontent in his mind. It may be replied that the War Office has issued a pamphlet giving full information on the matter, and that it can be easily obtained. I don't believe that one in fifty recruits enlisted ever heard of it, much less saw it. I don't believe that pamphlet has any more effect on recruiting than would a compilation from the "Materia Medica" or the "British Encyclopædia." It is too technical, red tapish, and dry. For the class of men required, something in popular form and language is necessary. You must speak to Tommy Atkins in his own language.

I think each recruit should, before enlistment, be told the lump sum value per week of his emoluments in supplies and money. A card with printed details would amply suffice to make the matter clear. On one side the total value, on the other side the deductions he is liable to.

Again, many writers and speakers on this subject and most soldiers speak of the money handed to the soldier week by week as "his pay!" It is no such thing. It is but the balance of his pay. It is his "pocket money," pure and simple. It is what remains after everything has been paid for necessary to his position, and he may spend it or save it how, when, and where he likes.

This should be made clear to the soldier. A further cause of discontent is in the treatment of the clothing question. Right or wrong, the man does consider it hard and unjust that he should be compelled to give up his time-expired clothing. A servant has not to do so, a

railway porter has not to do so, nor is it done in any similar case in civil life, and the soldier knows this.

To extend, therefore, the system of compensation, and to allow the soldier to keep his time-expired clothing, would be considered a great boon, and would do away with discontent on this head. It would also encourage the man in habits of care, cleanliness, and thrift that would be of great use to him in after life. Further, it would be a saving of money to the State, and prevent certain evils in connection with the sale of so-called worn-out articles to Jew contractors.

Some of the rank and file have been "writing to the papers" lately on the question of hospital stoppages, and one weekly paper has taken the matter up very warmly from the soldier's stand-point. How does the matter really stand?

On going into hospital the man is struck out of mess, he thereby saves 3d. per day on his groceries and 1d. per day for washing, and, if in hospital for a month, he saves his share of troop or company barrack damages. On the other hand, 7d. per day is charged him while in hospital, so that the balance loss in money to the man is, say 3d. per day, for which he has medicine, food, and hospital extras, &c. He may not return to health for months, yet he is kept entirely for 3d. per day, and his place in the ranks kept open for him. How does this compare with civil life in the same class? At the same time I think it would be well to keep free the man who is suffering from no fault of his own, and charge a higher rate to the man who suffers from his own neglect or misconduct.

In dealing with the financial aspect of any military question, I am conscious of the necessity of one very important obligation. It is necessary that one should possess, metaphorically speaking, a mental squint; while one keeps one eye steadily on the object to be attained, one must keep the other as steadily fixed upon the Treasury, that ever wakeful custodian of the taxpayer's pocket.

The proposals I am about to make are put forward on a basis of the necessities of the case from both points of view, and I may say at once that a change for the better all round will not be produced by adding 1d. a day here or there, but that while the pence are not left out of our consideration, the main benefit required will be derived from a judicious readjustment of several important matters, and I hope to show that by such an adjustment there will ensue an actual and tangible saving to the taxpayer, as well as a real improvement in the condition of the soldier in the ranks and in the Reserve.

Mr. Brodrick, M.P., stated the other day, "while, as a rule, there has not been much difficulty about money in England, its expenditure has been rarely judicious."

I had this in view in presenting to you my remarks on the clothing question.

Now with regard to the men's rations, &c., their free ration of bread and meat has to be supplemented by a stoppage of 3d. per day for groceries. Now I try in my regiment to give more for that 3d. by crediting the troop messing accounts monthly with a share of the profits on the coffee-bar. To do this, I have started a system of

credit. Every man may have a hot supper then for 3d. The bill is paid every week by the troop Officer. The system has worked well for eighteen months without a hitch of any kind. Drunkenness has been so reduced that the total fines for the regiment last year only amounted to 4*l.* In February the highest total of suppers in one night was 199; in March 195. The result is that the men are not now restricted to dry bread and tea for breakfast, but they have a choice of butter, jam, brawn, beef, or porridge every morning for breakfast.¹ Now, in connection with this, I think it would be a good plan that the whole of the fines for drunkenness should be divided out to all regiments equally—and that the unclaimed balances of soldiers dying intestate should also be so divided. I think such a readjustment would go a long way towards relieving the soldier without adding anything whatever to the burden of the taxpayer.

With regard to "good conduct pay," it should be borne in mind that the scale now in vogue is the same as was in vogue in the days of long service. Instead of a man receiving it as he does now, I think he should have 1*d.* good conduct pay every two years. The difference to the good soldier would be considerable; to the taxpayer inappreciable.

Money prizes are given for shooting and sword competition, &c., &c. I think money prizes should be given for signalling, map-making, and road reports, &c. This would be productive of greater interest and keener competition.

A minor grievance exists in the stoppage for "cleaning things." If the man must ride in a saddle or wear a coat, I don't see why he should have to pay for articles necessary to keep one clean, and the other the proper colour as to lace and facings; further, why should he pay for the pipe-clay for the belt, which is the property of the taxpayer? These may be deemed trifles, but life is made up in the aggregate of trifles.

I now come to the question of the condition and pay of non-commissioned officers. I think this matter is worthy of very grave consideration. I consider that non-commissioned rank should not be too easily attained, and when obtained should be worth holding. I do not think that the non-commissioned ranks are sufficiently paid when their responsibilities and influence are taken into account. A private with two good conduct badges and extra duty at 6*d.* per day receives in the cavalry 1*s.* 10*d.* per day; a lance-corporal with two good conduct badges 1*s.* 9*d.* I would suggest that every corporal who obtains a second-class certificate of education should receive 2*d.* per diem extra. The case of sergeants is still more important. In the cavalry, very specially we require first-rate men—men who know how to use authority: men who can act with judgment, dash, and effect in independent positions: men who morally, and by experience, are head and shoulders above those over whom they are placed. It

¹ Since writing above, I have reduced charge for groceries to 2*d.*, and the men have a free issue of extras for breakfasts, paid for from profits on canteen and coffee-bar.—F. G.

appears that the Germans are now paying a bounty of 50*l.* to induce sergeants to re-engage. I would suggest that no man should be appointed full sergeant unless he does re-engage. Our trumpeters, drummers, buglers, and pipers must re-engage on appointment as such. Why not a sergeant?

I would, therefore, enhance the value of the rank by allowing the sergeant to go on drawing good conduct pay every two years. I would also allow him to draw re-engaged pay at the rate of 3*d.* per day during his second period of service of five years. If this were done, there would be no difficulty in maintaining the splendid character the non-commissioned ranks have hitherto held, and which has done so much for the Army that they have been called its "backbone." At the close of his service, instead of giving him deferred pay as an inducement to go, I would give him a bounty to remain on.

I now come to what I consider the crux of the whole matter, to the point between service in the ranks and in the Reserve, i.e., "deferred pay."

The language ordinarily used in polite society is quite inadequate to express what I think on this subject. It was introduced, I presume, for a threefold purpose, to be an extra inducement to men to enlist, to stop desertion, and to give the time-expired soldier a good start in civil life. I am strongly of opinion that the prospect of "deferred pay" does not influence one in a hundred men to enlist; men desert mostly early in their service, and that, generally speaking, it is a positive hindrance instead of help to the bulk of men passing into civil life. I sincerely believe that the "lump sum" system of "deferred pay" is an almost unmixed evil, if not an actual curse to the Service.

Sir F. Roberts describes it as "an almost irresistible inducement held out by the State to men to leave the Service just when they are becoming useful to the ranks."

I know no more profligate system of wasting money than that of "lump sum" deferred pay. To place 21*l.* in the hands of a man who has seldom, if ever, had 21*s.* at one time previously, is to place a premium upon his going wrong, especially, be it remembered, that at the same time every bond of restraint and discipline is taken away.

These men, thus paid off, are the cause of much drinking among their comrades; they are the cause of anxiety, trouble, and great annoyance to railway officials and passengers on their way home. The station-master of an important military station informed me personally that the scenes enacted on the departure of reservists sometimes quite beggar description. They arrive home in vast numbers of cases without a penny, and if they do bring money with them, it is soon spent in riotous living with the village loafer and ne'er-do-well.

Evidence as to this can be obtained from recruiting offices, masters of unions, and chief constables all over the Kingdom. I quote one of many. The chief constable of York writes to me, ". . . . Very

many men come away with all their deferred pay in their pockets at once, and being, as it were, emancipated from all control, they go on the drink and frequently lose all their money in two or three days."

The temptations which surround and dog the footsteps of the soldier in his daily life are such that on his release from the influence of discipline the possession of 21*l.* is a positive danger to him.

I would suggest that the whole system should be readjusted, and I hope to put before you now a method which will be distinctly helpful to the man and economical to the State.

I propose to do away with the lump sum system as it exists, and substitute the following :—

Pay the man 1*l.* 10*s.* on leaving his corps, and 1*l.* 10*s.* at his home a month later, then spread the balance at 2*d.* per day over his five years' Reserve service. This will start him, and also raise his Reserve pay to 6*d.* per day, not counting 2*d.* per day deferred pay paid to him every year of Reserve service.

Now let us examine this proposal from the taxpayer's point of view.

For every 5,000 men passing to the Reserve after seven years' service the State pays down 105,000*l.* in a lump that year.

Let me present a balance sheet for the first year on 5,000 men, comparing foregoing proposal with present system.

Present system.		Proposed system.			
	<i>£</i>		<i>£</i>	<i>s.</i>	<i>d.</i>
5,000 men at £21.....	105,000		5,000 men × £1 10 <i>s.</i> ...	7,500	0 0
			5,000 " × £1 10 <i>s.</i> ...	7,500	0 0
			5,000 " × 2 <i>d.</i> × 365 days	15,208	6 8
Total	<u>£105,000</u>		Balance Cr.....	74,791	13 4
			Total	£105,000	0 0

The balance cr. of 74,791*l.* 13*s.* 4*d.* is then spent at the rate of 15,208*l.* 6*s.* 8*d.* annually, and dies out at the end of four more years.

By the adoption of my proposal, as set forth above, there would be a gain to the State in this way: there has been an average loss by desertion from the Reserve for the last five years of no less than 1,431 men annually; this means that at the rate of 21*l.* per man paid down, the State has sunk 29,651*l.* in men over whom it has lost all control, a considerable proportion of which would be saved by the adoption of my plan, as a large balance would be in hand. If 14,000 men pass to the Reserve this year, as last, at 21*l.* each, the lump sum paid by the State this year will amount to 294,000*l.*

Again, the Reservist's pay is 4*d.* per day paid quarterly in arrears, and once a year he receives 2*d.* per day deferred pay in arrears, or 3*l.* 10*s.* + his regular Reserve pay. This means practically that once a year he is thus encouraged to have a bigger drink than usual. It is significant that this payment is made about the 1st of April each

year! I would spread this sum at 2*d.* per day over the whole of his Reserve service, and thus raise his pay to 8*d.* per day, and so materially benefit the man, and, as I trust I have shown, prove economical to the State. This sum would keep body and soul together, and if it were paid monthly instead of quarterly as now, I am convinced would absolutely stop desertion from the Reserve.

One of the difficulties of the question is how to harmonize the interests of the 1st Line and those of the Reserve. No one will question the fact that we want more seasoned men in our ranks; but it is said that to allow them to re-engage largely would rob the Reserve. This is true. Yet, if they were thus allowed to re-engage, the present system of deferred pay debars the vast majority from doing so, for before re-engagement the man must pay back 2*l.* received on discharge. To do away with deferred pay as I suggest, and institute *Reserve pay pure and simple*, would remove this hindrance. How then safeguard the Reserve interests? Now, mark well, General Rocke states in his last Report, ". . . . the State has, during the last five years, lost the services of upwards of 38,000 men—a loss to be deplored, having regard to the fact that all such men have been trained to arms, and are in the prime of life, i.e., from 30 to 35 years of age." These are men who, having completed five years' Reserve service, decline to enter Section D (Supplemental Reserve). I suggest, therefore, allow any man of good character to re-engage for five years' colour service who will at the same time consent to four years' service afterwards in Supplemental Reserve at the pay allotted to that section. Thus the colour ranks will be stiffened, and the interests of the Reserve safeguarded.

I venture to submit another reason for doing away with the lump sum system of deferred pay. Not only does the Reserve lose 1,400 or more men every year through absence, but year by year a large number become non-effective through death. The Reserve now amounts to, say, 60,000 men, mostly to be found in large centres of population and in the poorest neighbourhoods, where the death-rate is above the average. Let us take the average mortality at 20 per 1,000; this rate would give us a loss to the Reserve of 1,200 men per year from this cause; this means that the State has lost the services of 1,200 men in whom has been sunk 25,200*l.*

I conclude, therefore, that deferred pay should be done away with, and that the terms offered the recruit should be so much while serving in first period, 3*l.* cash within a month of discharge to Reserve, and 8*d.* per day *Reserve pay for five years.* To procure the latter, he has but to live and to demand his money. I maintain that both the soldier and the country would be large gainers, instead of, as now, being losers under a system baneful to the soldier and wasteful to the State.

III. *The Condition of the Army Reserve.*

The condition of the Reservist has, I hold, a great effect for good or ill on the question of recruiting. He is the practical exponent, the living advertisement, of the effects and results of life in the ranks.

If he can speak well of his experience, he becomes an unpaid recruiter. If, on the other hand, he decries the Army, and, should he be in destitute circumstances and attribute his miserable condition to the fact that he cannot obtain work because he is a Reservist, he deters men from enlisting, and acts as a "scarecrow" to would-be recruits.

It should be borne in mind that the bulk of our Recruits are to be found in large centres of population, and that these very centres are more and more prolific than formerly in contributing recruits. General Rocke states in his last Report, "The effect of the continued exodus of the working classes into the great industrial centres is but too plainly marked by the decreasing numbers contributed by the rural districts."

Mr. J. Chamberlain, M.P., in his great speech at Portsmouth on the 2nd inst. said, ". . . I very often hear complaints from working men of low wages and scanty employment. Have you ever considered what is the chief cause of low wages? . . . When you go to your factories and workshops, enquire how many of your fellow-workmen are natives of this town of Portsmouth, and how many have come in from the country districts as competitors to lower your wages and lessen the amount of employment which, as long as the condition of the agricultural labourer is so hard and hopeless, so long as he is condemned to limit his ambition to the miserable sum which will hardly keep body and soul together, so long you may be certain the most active and intelligent and energetic of that class will infallibly be drawn into the towns to seek for work and bring down the rate of wages." Well, these young men do go to London and other centres, and what do they find? They find large numbers of Reservists in a state of semi-starvation, out of work and with no hope of obtaining work because there is a prejudice among civilian employers against taking them on. They find these men in districts described by Mr. Chamberlain as "infested with disease, districts which seem to be permanently handed over to squalor, misery, and crime." They take the condition of the Reservist as they see him as that to which they will as surely descend if they become soldiers, and the recruiting sergeant then charms in vain. That this is the condition of great and increasing numbers of our Reservists is witnessed by such well-known writers as Major C. W. White, General Trench, General Chapman, Mr. Arnold White, *cum multis aliis*. Mr. A. White states that, "out of more than 4,000 men whom he had found in the course of one bleak winter sleeping out of doors like animals, returns it as his conviction that at least 20 per cent. are army men."

I have gone among them myself and bear out the foregoing from actual personal observation. General Trench in his "Dark Side of Short Service" says: "Boycotted and rejected by all, the Reservist has long ago become nobody's child. . . Large numbers of them swell the population of the lowest classes in the far east-end of London. A large proportion become professional vagrants. . . ." In support of this, he quotes evidence to show that ". . . in one workhouse, 270 men who had served with the colours found relief in

the casual ward." A chaplain to another union writes, "Our Officer of vagrants last year stated that 90 per cent. of our tramps were discharged soldiers, short time men."

In one of the publications of the Howard Association you will find it stated that, "A considerable proportion of the professional vagrants have been in the Army," and, "At present, many discharged soldiers pass on to prison and to crime."

If the foregoing be true, it proves several things clearly to my mind, first, that the 21*l.* deferred pay received has not helped to start these men in civil life, that their 4*d.* per diem is not enough to keep them off the rates, and that many doors of employment are closed to them simply because they are Reservists. I contend, therefore, that to abolish "Deferred Pay" and give the Reservist 8*d.* per day would settle satisfactorily the first two points. I must now examine the pros and cons of the last.

I maintain that the man who has served his country at the possible risk of his life; has suffered, possibly, in that service; and has ended his service with a good record, has special claims on the State first, and then on the individual employer of labour.

I maintain that if the idea is allowed to gain ground that the State practically ignores, and that the civilian employers of labour, generally speaking, boycott the Reservist, the greatest injury will be the result upon recruiting prospects.

Allow me to deal with the State first. It does not form part of my functions here to-day to formulate an attack upon any particular department or individual in connection with this matter; I am dealing with a system, and in so doing, I recognize no such thing as a "muzzling order" as applying to discussions in this theatre. I say, therefore, that, generally speaking, our State treatment of the Reservist is utterly ill-advised, uneconomical, and injurious to all concerned. It is downright humbug for the State to appeal to the patriotism of the great employers of labour to employ Reservists if the State fails to set the example. Not only does the State not set a useful example in this matter, but obstacles are put in the way of Reservists being employed, for I find a certain rule in existence, I need not say where, which runs, "From the pay in each case, no matter what the situation may be, the amount of army pension or Reserve pay, if any, will be deducted, so that the total payment . . . shall not exceed the remuneration of a civilian of equal standing." This means that the State who claims the right for 4*d.* per day to send the man forth as food for powder and shot expects him to render the same day's work for a less wage than that received by a civilian over whom no such right exists. Is this just? To my mind it is contemptible. The position of the Reservist is exceptional; the State has exceptional claims upon him, I therefore contend he has claims upon the State of an exceptional character, and that the State should treat him as one of a privileged class. Can this be done? I think so; and with great advantage to the State, the man, and the prospects of recruiting.

General Chapman says that "there are at least 2,000 posts outside

regimental life that could be profitably filled by Reservists." I agree with him.

There are also a great number of posts filled by men borne on the strength of regiments as fighting units that would be equally well filled by Reservists, and with this great advantage, that the men of regiments would be released to their proper work.

Take my own regiment as an example: it is on war footing, the men are supposed to be practising in peace what they will have to perform in war, but my ranks are depleted to furnish men of good character and long service to the remount dépôts at Dublin and Woolwich, the military troop at Sandhurst, the military offices, school and canteen locally, also as divisional and brigade orderlies, messengers, and postmen. I maintain that every one of these posts should be filled by Reservists, and that my men should revert to their regiment.

Then in a regiment, all servants, Officers' and sergeants' mess waiters, storemen, cooks, school assistants, canteen waiters, and some clerks should be Reservists. Of the 4,000 or more cavalry Reservists, how many have been on a horse since they left the colours? Not one in a hundred; but by thus bringing them back they can have a course of riding and shooting periodically, and they would then require less "knocking into shape" in a time of crisis.

The same applies to infantry. I have before me, as I write, a Return showing 96 rank and file employed in work that takes them from soldiering, and yet this Return is from a regiment in 1st Army Corps.

To sum up. If the State will open such posts to Reservists; if the Post Office will employ Reservists for mail carts, also as sorters and carriers; if Woolwich Arsenal and Enfield (which employ 13,000 labourers) will take them on; if the Public Offices will employ them as messengers and porters; if many clerkships in Government offices were filled by Reservists; the State might then fairly go to the civilian employers of labour and say, "Follow my example and find employment for, and stand by, the men who are the followers of those who have bled and died to make our nation what it is, and who are still bound, in the time of their country's need, to risk their lives in order to pull the British chesnuts out of the fire, and by so doing to ensure peace and prosperity to their fellow subjects."

As it is, the condition of thousands of Reservists is pitiable. Pay-masters testify to the great trouble caused by constant changes of address by Reservists, proving non-employment. Chief Constables testify to their misery as deterrent to recruiting. The Hon. G. A. Anson writes me from Stafford: "I think more of the better class of recruits would be obtained if the status of discharged soldiers were more enviable." Recruiting sergeants write to say how they are hindered in their work by unemployed Reservists. I quote one who says, "I believe I am right in saying the greatest enemy to recruiting is our Army Reserve." Why? Because thousands of them are sunk in a state of hopeless despair. As Mr. Chamberlain pleaded for the

agricultural labourer, so I plead for the Reservist. Give him back "the solace and the promise of hope"—

"Hope, of all the ills that men endure,
The only cheap and universal cure,
The captive's freedom, and the sick man's health,
The lover's victory, and the beggar's wealth."

The Secretary of State for War said in the House of Commons, that "in the report of the Inspector-General of Recruiting there is a good deal to cause alarm." I see one cause of alarm, namely, that if the present condition of masses of our Reservists is not improved, and that soon, we shall see the general standard of physique further lowered, and we shall have to accept the very dregs of the labour market, and when a crisis arises, we shall have to reinforce our regiments by sweeping up the Reservists from the stone heaps by the roadside, and from the hank of oakum in the casual ward; to find them wan, gaunt, hungry, drooping conscripts of destitution and despair brought back to the ranks to fight in the interests of those who have neglected them and allowed them to starve; and yet they will fight, and then, in the hour of victory, the churches of our land will ring with Te Deums of praise, and on his return the soldier will be greeted by vast, thronging, cheering crowds, and march to his quarters under triumphal arches and mottoes of welcome, to the heart-stirring strains of "Home, Sweet Home." What then? When the victory won has ceased to be a nine days' wonder; when the victors have been praised, feasted, and feted; what then? What is his home to be? Is he to be allowed to go back to the tramps' lodging, in a filthy slum, or to the casual ward? God forbid! Let us hope and trust for a better state of things. Let us, one and all, work shoulder to shoulder to ameliorate and raise the position and condition of the Reservist, and to restore to him "the solace and the promise of hope," in order that it may never again be written of our nation that—

"When war is over and affairs are righted,
God is forgotten and the soldier slighted."

General DASHWOOD: Sir Arthur Herbert, ladies, and gentlemen, I think there can be no doubt that the recruiting difficulty is a real one and not imaginary, although the reports of the brigade dépôts are not so bad as we might suppose. In the reports the word "Fair" often occurs; it is often understood in reports of that sort that the word "Fair" means "Bad, but I do not like to say so." As to the causes assigned to this recruiting difficulty, they are various. Some three or four years ago the "Times," which is supposed to be the leader of public opinion, said that the fault was with the Officers, more especially the Commanding Officers, who did not take interest in their men, and who, moreover, were harsh to them. I think we all know that was an unfounded accusation and very unjust; but at the same time, when an accusation of that sort is made, the reason is to hide the real delinquents, the Government of the day; but still an accusation of that kind is very apt to "catch on" (as the Yankees say) with the masses, and they believe in it, especially the Radicals. Last year people took up a new idea, and they said, "The discipline of the Army is too severe," and a great deal was written on the subject, and very pernicious nonsense in my opinion. One man wrote that it was very hard that a soldier should be severely punished for an offence that in civil life would merely

entail a fine of a few shillings. A statement of that sort shows that the man, whoever he might be, knew nothing whatever about the matter, and that the very rudiments of discipline were altogether absent from his mind. There have been a great many articles written also in magazines, and I should like to touch shortly on one written by Mr. Archibald Forbes, in the "Nineteenth Century," of February or March. Mr. Archibald Forbes, in speaking of the private soldiers of twenty-five years ago, at the time when I was a regimental Officer, says that they were habitually addressed by their Captains as "D—— brutes." I say that is a most monstrous statement to make, and a most atrocious libel on the Officers of the Army generally. It is altogether at variance with the good feeling that obtains between Officers and men, and I say further it is altogether opposed to what is one of the chief cornerstones of discipline and efficiency, namely, the mutual respect that exists between Officers and men. The statement is unjust and untrue, and moreover is a spiteful remark made by a man against his social superiors. With regard to the real causes of the recruiting difficulty, of course we know that sufficient inducements are not offered. Unfortunately the opinions of the Officers of the Army, and the opinions of those who rule, do not always agree. In foreign countries the Officers are believed, and notice is taken of what they say. Here I cannot say that they are. In foreign countries the people insist that the Army shall be to a great extent managed by soldiers, because, having been invaded by foreign Powers, it has brought home to them the real necessity of defence. That is not the case in this country, and until something of the same sort takes place we shall find it hard to get a change. Then there are other causes. We have two sets of people looking at the thing from entirely different starting points. The Officers of the Army say, "We must have efficiency as economically as may be, but at all events efficiency." On the other hand politicians start with the idea that "We must have cheapness. If we can palm off upon the people a spurious efficiency and at the same time get credit for the economy we shall be all right, and we shall get their votes." This is most unfortunate. Colonel Graves, in his interesting lecture, has apparently tried to make out—I do not say he has not done so—that the position of the soldier is quite equal, if not better, than that of an ordinary man who is not a skilled mechanic. The point is, are the great mass of people whom we want to attract to the colours of that opinion, or are they not? If they are not of that opinion, although it is perfectly correct on paper, then those inducements must be increased. A statement has been made with regard to stoppages, and I am very glad to see that the question has been raised in the House of Commons, especially as to the sea kits; but it was rather amusing that the Secretary of State for War, in promising to see about these sea kits, gave the very curious excuse that he had only just heard of them. This question of sea kits has been before the public for some time, and the Army have known it, of course, since its introduction. There is another point which has not been brought forward before the House of Commons through the apparent apathy of so-called military members, and that is that a soldier landing in India is put under stoppages to the amount of 30s. for kaki and white clothing. The compensation he receives from the Government only amounts to 15s. When I was in India, in 1883, the expense of kaki uniform was very much increased by the dress fads of the Officer at that time commanding the Bombay Army, but I am glad to say that on the arrival of his successor, this ridiculous kaki pattern was abolished. Many remarks have also been made by Colonel Graves, in which I quite agree, as regards Reserve men and the deferred pay. Of course the reason why the Government will not throw open numerous berths to Reserve men is because they do not want to give up their patronage. Members of both Houses will not give up the power of appointing people who really have no claim on the State. Numerous berths in the public offices are held by men who were servants to Cabinet Ministers and others; men who thus obtain one of these posts are said to have come through the pantry. I want to see the reverse of that, and the way to such employment lie not through the pantry or the scullery or the kitchen, but through the barrack room. I want to see the Army made a stepping stone to certain berths which should be kept for soldiers. At present it is not so. With regard to enlistment, I should propose that every man should be enlisted for a term of seven years with the right, pro-

viding that he was medically fit, and was recommended by his Commanding Officer, to re-engage for a further seven years with a slight increase of pay; at the end of the fourteen years he should be entitled to re-engage until twenty-one years, under the same conditions, which would entitle him to a pension. Every soldier should serve in the Reserve or with the colours for twenty-one years, and at the age of forty-four every Reserve man should get a pension according to the time he has served with the colours. Of course we know the people at large say we cannot have pensions because of the expense; but they forget that, if you give a man so much a day and deprive him of a prospective pension, you are really offering him less than before. They never see that, and in the case of deferred pensions of course this inducement acts upon every man who joins the Army; but at the same time a great many men do not live to earn it, whereas if you increase a man's pay, and he dies, you have to pay somebody else; therefore there is a good deal to be said on the pension side. I think also that deferred pensions would obviate the difficulty of men who refuse to go into the Supplemental Reserve. All I can say is, if the people of this country will not pay either in coin or in equivalent, coupled with indirect advantages sufficient to procure an efficient Army, unless they are willing to suffer annihilation by a foreign Power, they must submit to a taxation of flesh and blood, in other words, Conscription.

Lieut.-General DUNNE: After the admirable and eloquent lecture which we have heard, I trust that I may be pardoned by you, Sir, and the lecturer for making one or two little semi-critical remarks on some of the points he has brought forward. The admirable plan adopted in the 20th Hussars of increasing the evening meal and giving supper, &c., seems to be in great measure founded on the profits derived from liquor. Now you, Sir, when at the Curragh, may remember that we had a medical Officer much more fitted to be a Methodist parson, who managed to make temporary total abstainers of upwards of 300 of my men. If he had made permanent teetotalers of some 600, where, then, would the profits of the canteen have been? It is not a plan, I think, that Colonel Graves can rely upon, although it is a very excellent thing as long as it lasts. Now, as regards the point of extra pay for these Reserve men in the Supplemental Reserve, it comes to this: that after seven years, Colonel Graves says they are to be persuaded to serve on for five more years with an agreement that they will then remain for four years more in the Supplemental Reserve. Seven, five, and four make sixteen. Will a man serve for sixteen years, the best part of his life, if he is not in some way offered a permanent pension at the finish? Every Commanding Officer, I am sure, will endorse the remarks of the lecturer as regards the immense benefit we should all have derived in the past, when we commanded regiments, and those who are now commanding them would derive, if all these extra offices, orderlies and regimental and garrison men required for different services, if all these employments were given to Reservists. But then comes the question of the money, for it might mean at least 10 per cent. added to the expense of our Army, less the Reserve pay of these men, because at least 10 per cent. of the strength of every regiment is used up more or less in that sort of way. I am sure that every old soldier will agree with the eloquent oration of the lecturer on the subject of the present state of the Reservists, and that every word that has been spoken by him is to a great extent correct; but still there is one thing which I think might be borne in mind, and that is, that the entire employment of Reservists would be attended with some difficulty (I have employed pensioners four or five times myself; I have found them often given to liquoring up, very conceited, and troublesome, and, in some cases, totally impracticable in private houses; they were always talking of what Captain this and Colonel that did for them). What I mean is, that if the Government were to employ nothing but Reservists within the walls of the Foreign and all the public Offices, what a terrible collapse there would be on the declaration of war! Those are the only points on which I venture to criticize the lecture, which I assure you I have listened to with the greatest possible interest. At the same time—I hope the lecturer will pardon me—I cannot help expressing a slight feeling of disappointment, for I did hope that an Officer of his undoubted ability, with such experience, and who has worked out the whole thing so well, would have offered us a prescription of such a strong and effective description that would have entirely allayed that feverish excitement

which somehow or other has arisen in the country just now on the subject of recruiting. I believe not only myself but all the Army will agree on the value of the points that he has recommended; but still the question comes very much to what General Dashwood said, Are these allurements sufficiently enticing to get exactly the right sort of men that we at the present moment require? The sort of men who enlist probably from hunger, from some female or some poaching difficulty, are they likely to be deeply impressed with what the lecturer has so clearly and distinctly shown to be the advantages of military life over civilian? If War Office pamphlets do not induce men to enlist, as he himself said, I do not think that even all he has suggested on the subject to-day will catch the right people; I do not think that his alterations will be sufficient to meet our difficulties in an age when *Dulce et decorum est pro patria mori* is, I am sorry to say, not of the slightest use in tickling the hearts of the young labouring men of this land. The other day, when Colonel Dooner was lecturing, I said in despair, that I believed the only thing would be ultimately that we should have recourse to the ballot for the Militia; but since then I have read up and talked to people as to the state of the ballot in the years of the old Peninsular War, and there is no doubt whatever that the system of paying substitutes was so bad that it entailed the enlisting into our Army of a vast number of blackguards; they were not worthless blackguards, because they proved afterwards that they were good fighting ones. I am afraid, notwithstanding all the lecturer has said, that there is no manner of doubt that it comes to this, that at the present moment our recruits are too young, and that no increase of pay that the country will ever consent to will get us the older ones. The difficulty is that regiments nowadays, from short service, require from four to five times the number of these youthful recruits that they did in old days, and I cannot help thinking that unless the country will pay for keeping up large home establishments in order to develop these boys into men, they will have to pay, either with bribes of higher pay, bounty, or pension, that class of men which they absolutely require for service abroad and for active service also. Were I to go into the recruiting question and into the weaknesses that exist in "our great old Constitutional force," owing to the present system of our enlisting, I should occupy at least another ten minutes.

Lieutenant-General FRASER, V.C., M.P.: I would say but one word after the most eloquent lecture we have heard; I am most happy to have been here. Whether in one or two minutes I agree, has nothing to do with it. I rise merely to say, as an Officer remarked that perhaps by reason of the apathy of the Service Members of the House of Commons, a question has not been brought forward referring to what we used to call in India the kharkee kits, I can only assure you that that question was amply brought forward. The daily papers do not report everything that is said in Committees by Members of the House of Commons who have served in the Navy and in the Army; but be assured that, whatever our apathy might be, we look to your interests.

Captain HUGH PEARSE (Adjutant 3rd Vol. Batt. East Surrey Regt.): There is only one proposal in Colonel Graves' very interesting lecture to which I venture to suggest an amendment: that is, his proposed substitution of Reserve pay for deferred pay. I admit that his proposed system of payment would be a great improvement on the present ruinous throwing-away of money; but in my opinion it would be a much better plan to reorganize the Reserve altogether. Colonel Graves says that he cannot express his opinion of deferred pay in polite terms, but he says, (1) "It does not induce one man in a hundred to enlist;" and (2) "It is a positive hindrance instead of help to the bulk of men passing into civil life." In short it is a failure, both as regards the State that pays it and the soldier who receives it. If these are facts, what inducement can there be to continue paying a large sum annually which is both useless and harmful? The fact is that the interests of the Home Army and of the individual soldier are sacrificed to the formation of a Reserve. In a voluntary Army, such as ours is, it is an anomaly that the majority of men in a branch of that Army should be kept in it against their will. But I believe that the majority of the 1st Class Army Reserve would give anything to get out of it: either to be civilians pure and simple, which would give them a better chance of getting employment, or to return to the colours. In proof

of this I will mention that when men were allowed to return to the colours by refunding their deferred pay at the rate of 6d. a day—a very heavy stoppage for a soldier to submit to voluntarily—so large a number flocked back, that the authorities, in alarm, stopped the privilege and insisted that the deferred pay should be refunded in a lump, which of course the men could not do. My contention is that neither deferred pay nor increased Reserve pay should be given to tempt men into a Reserve in which they cannot support themselves and in which they are a hindrance to recruiting and a burden on the country, instead of being useful citizens and trustworthy soldiers. It would be better to return to a long-service Army, which would be a real safeguard to the country, than to have an inefficient¹ home Army with an impoverished and discontented Reserve which has lost the habit of discipline and would, if called up, simply disorganize the battalions into which it would have to be drafted.

Colonel Hon. CHARLES BYNG (1st Life Guards): I must first claim your indulgence while I endeavour to add my mite of support to the most excellent lecture that we have just heard from Colonel Graves. I think he has spoken thoroughly to the point, and I heartily go with him, and even beyond in some points. First of all, with regard to inducements to recruiting, I think he is quite right; let us tell the ranks from which the recruits are drawn what they have got to expect; let us talk to Tommy Atkins in his own language; let him know what he is to receive as his pocket money, and if it is possible, and I think it can be done, let us abolish stoppages. Stoppages are what I, when I had the honour to command a troop, used to find the only trouble I had with my men, because, on the monthly settlement, they wished to know, why this, and why that? Now, I think by doing away with stoppages, letting the man know that he has so much money to receive, and providing other things free, you will make him happier and contented. With regard to clothing, let us look at it in the same way as the livery of domestic servants, and I think it is a very fair way to look at it. We soldiers are all servants of Her Majesty. I am all for letting the clothing be the property of the wearer, and if through some means or another (either that a man is a batman or employed in some way or other) he does not wear it out, let him sell it to some comrade who has been unfortunate enough to spoil a good stable jacket or tunic. The smart men will generally be picked for the hard work, orderlies, and escorts, and they will wear out their clothes very frequently faster than some of their less smart comrades. Then, with regard to the recruit on joining, no doubt the bait which catches our fish is the smart tunic or jacket, or something of that sort, and the young fellow, on joining, expects, in a week at least, to be able to walk outside the barracks with the same jacket on as he has seen the man who has brought him up wear; instead of which he is given partly-worn clothing, possibly it may be the jacket or tunic of some non-commissioned officer, which bears the marks where the chevrons have been cut off, and the lace has been removed; perhaps the marks where the ribands carrying the medals have been: in fact, it is a shabby article, very often dirty, especially when a scarlet one; and that disgusts the young soldier, and induces a great number to purchase their discharge under the 10*v.* rule, at present in existence. With regard to deferred pay, I go heartily with Colonel Graves. He says in his lecture that "deferred pay does not induce 1 in 100 men to enlist." I sincerely believe that the lump sum system of deferred pay is an almost unmixed evil, if not an actual curse to the Service. I think that, to induce thrift and habits of economy, the regimental savings bank should be brought under the notice as much as possible of every man, and that he should be encouraged to deposit his savings in it. I do not wish to take praise to myself, but I was once in the proud position of being able to tell a General at inspection that every man in my troop put into the savings bank. You may say that a man, by this means, would take away an equally large sum with him. Every man, when he leaves, must be going to some destination, for the regiment is very rarely quartered in the town in which he lives. Why should not

¹ Inefficient from no fault of its Officers or men, but from being made a mere training depot for the troops abroad.

the money that this man has in the regimental savings bank be transferred to the Post Office Savings Bank at his future home? I think the more you can encourage thrift and saving amongst the men the better. They will then have got into the habit of carefulness with regard to money, and they will not be so inclined to spend all their money at once, as they are under present circumstances, when a lump sum is handed to them, of which they have never seen any part before; of which they have not been deprived, and of which they have not felt the want. If they have the money, and then put it into the savings bank, they are depriving themselves of something; therefore, I think if you can get them to put money into the savings bank it is far better than keeping it as deferred pay, which I am afraid is generally the cause of the troop or the company having a carouse, and generally taking away some good-conduct badges. Then with regard to education; no doubt we are all very much educated nowadays, and we all read the papers, and the papers are now brought so much before us on account of their cheapness that, even if a recruit or a soldier of many years' standing is more or less inclined to be happy, somebody who reads more tells him that he is not happy, and goes on reading extracts from papers to prove to him that he is not happy, and the poor fellow begins to think he is not happy. Let us put ourselves in his place, and endeavour to make him as happy as we can, and so disprove what these agitators say by making his home as comfortable as possible, his barrack room as nice as possible. I have read speeches that have been made here, showing that Officers commanding regiments and battalions have tried all they can to meet this difficulty; but I think there is one little thing which I have not noticed to have been suggested so far, and if any credit is due to this or any remark I have made now, I can only say that it has been suggested by a long conversation that I have had with an Officer who at present holds the position of Adjutant to my regiment, whose advice I have asked on the subject, and whose opinions I value most highly. I only wish he were here to-day, because I am certain he could explain better what I am endeavouring to explain now. His suggestion, in which I agree with him, is that in the barracks there should be a room by the guard room, or as near as possible, in which visitors coming to see soldiers should be allowed to sit down and wait; instead of, as we have often had to see, people hanging about the gate, obstructing the entrance of those whose business it is to go in, and, very often, owing to the crowd that collects outside the gate, improper characters are enabled to get inside. If we could only have an ordinary room, with a few seats, where a man can go and meet his friends, it would be a very great advantage to the soldier. There is nothing, I think, that better shows that a man is happy than that his father, mother, sister, brother, and relations of all sexes should come and see him. I want them to come and to see him, and to see that he is happy, because when they go away they can say to each other, "Bob is very happy there; the sooner Harry joins the better." I cordially agree with Reserve men being employed as servants, &c., so as to avoid the necessity of employing men in the regiment. I think by this means Officers commanding regiments and battalions might have an opportunity of seeing their regiments and battalions on parade. I am given to understand that the General Officer Commanding at Aldershot has struck off each brigade in turn from camp duties in order that Officers may have an opportunity of seeing their men; and I think all these posts, such as servants, orderlies, cooks, and canteen men, might be very well filled by Reservists. Let them come up each year or biennially, for a month or two months' drill, say in October and November, after any summer or autumn drill that there might have been going on. For example, they would be able to groom the horses in the cavalry, and thereby allow a greater number of men to go on furlough, and so make the Army more popular. Then there is another thing. It has been said that we never teach our soldiers anything. Let us try and institute schools for learning trades in the regimental districts and at the big camps. Surely, if in prison you teach a prisoner to do useful things, why should not you teach soldiers trades that would be useful to them after they have left the Service? Could not they make some part of their clothing? Could not they make boots? Could not they do carpentering work? And I should be very much disappointed if, amongst pensioners or Reservists, there are not men of sufficient ability to act as instructors.

Let them have a little shop to sell these things at, and allow the instructor and his pupils to receive a percentage on all articles sold.

Captain R. D. WYNYARD: I do not think any apology is necessary from me for addressing remarks to the many senior Officers whom I see here, for this reason: I think a junior Officer, such as I am myself, has many more opportunities of getting hold of the opinions of the private soldier of the present day than a General Officer. I think a man will speak his mind more freely to the Captain of his company than to the General Officer who inspects his battalion. I have for four years acted as Adjutant of a regimental district, and have therefore been brought in daily contact with recruits in the first three months of their service, before they go to join their Line battalion. Colonel Graves has stated that great numbers of our recruits are too young, and that at certain periods of pressing need many are enlisted who do not fulfil the conditions of the physical requirements for their calling. In support of this statement, I think this "period of pressing need" must exist at the present time, for this reason: during the year 1890, 369 recruits for the Regular Army were raised at the headquarters of the 31st Regimental District at Kingston-on-Thames; of these, only 143 men came up to the standard, the remaining 226 being enlisted under special authority from the Horse Guards. In support of the opinion expressed by the lecturer, that "the prospect of deferred pay does not influence one in a hundred men to enlist," I will recount the following circumstance, which occurred only yesterday. Ten men presented themselves for enlistment into the Regular Army at our barracks at Kingston-on-Thames. I got them together in the presence of the recruiting Officer, and, with his permission, questioned them, and there was not one of those ten men who had ever heard of deferred pay; they did not know what it was, and, in spite of leading questions on the subject, I could get no nearer answer or opinion from any one of them than this: one man had heard that after he had done his seven years colour service he would get what he called a bounty, but whether it was 1*l.* or 50*s.*, he had not any idea whatever. No doubt, a lump sum of 21*l.* down is an inducement to leave the colours which few men can resist. As regards the sufficiency of the soldier's pay, I think there are few men in civil life, of the class from which the recruits are drawn, who have their 3*s.* or 4*s.* a week hard cash in pocket-money on the weekly pay day, and I know, from inspection of the pay list, that this is about the average sum that they get, after having paid for their food, clothing, accommodation, and everything else. But I think that the pay of those who re-engage should be increased, for this reason: I do not think it is fair that a veteran of twenty-one years' service should receive exactly the same pay as a recruit of two days, and I do not think the men think so either, and I think we should pay the non-commissioned officers, as well as the men, a somewhat higher rate on re-engagement. As regards good-conduct pay, every man in receipt of good-conduct pay has earned it, and richly deserves it, if the system of deprivation of badges is strictly carried out. One point that the lecturer has not touched upon, and which I think a very serious one, is the presence in the ranks of fraudulent enlists. "Frauds" I think are very much against recruiting, for they do not make the soldier's life in his barrack room a happy one. There are men who make a trade of deserting and re-enlisting. If this could be stopped, the soldier's life would be a pleasanter one, and the taxpayer would be saved large sums of money. The only means to this end appears to me to be the tattooing of every man who joins Her Majesty's Service. I am tattooed myself, and I know the process is not nearly as painful as the recruit's course of musketry with the Martini-Henry rifle. I would suggest the insertion in the attestation paper of this question, "Are you willing to be tattooed?" after the existing one, "Are you willing to be vaccinated?" In proof of my statement—at least, I have not stated it yet—that tattooing is almost universal among the class from which our recruits are drawn, I have looked over the attestations in my possession, and I find that during last month we enlisted in the East Surrey Regiment fifty-five men, forty-three of whom were tattooed; so that I think the practice popular amongst the class from which the men are enlisted. If Officers were to set the example, the royal cipher tattooed on every person who has served his Queen would soon become an honourable distinction.

Major-General SYNGE: It seems to me that there was an all but universal feeling

that an increase of expenditure upon the Army might attain the object which was brought forward at Colonel Dooner's lecture. Colonel Graves at that time spoke rather against it, if I understood him correctly, and, although unable to be present earlier to-day, having carefully studied Colonel Graves' paper, it seems to me that he has established, beyond all power of shaking, the fact that, as far as monetary considerations are concerned, the soldier is at anything but a disadvantage. In establishing his premiss, however, I think also that Colonel Graves has put his finger upon the darkest blot on the whole country's social life, and it is one that must affect the Army indirectly, for it does not improve or affect the soldier's position *per se*, that civilians of certain classes of corresponding social rank are existing in a state that would shame any barbarian that has ever existed on the face of the earth. That does not enter into the question; it is a scandal and a shame and a reproach, of which every Englishman has to bear his portion, so long as it is suffered to continue. It should be an utter impossibility that our fellow human beings should be brought to the condition that the lecturer has irresistibly shown to exist; still, I say again, that this does not affect the question which has been so very practically and concisely put by some of the speakers. We have to look not so much at what, in the abstract, might be, and would be if our social life were governed by higher considerations. The practical point is this: we must either have a voluntary Army, or we must pay a tax in flesh and blood. Neither does the degradation of certain unhappy classes touch the question and principle of improving the soldier's position in every way, so as to induce men to qualify themselves for becoming first-rate non-commissioned officers, and then to cling to remaining with the colours they have learned to love. I thought I had lived too long for my own happiness, but really I am quite glad to find some very young-looking members of this Institution here who seem to remember the days when that onslaught was made upon the character of the gentleman Officer, that time when the "Times" poured forth its endless streams, as if the most obnoxious things in the whole Army were its gentlemen. It was at that time also that the practice was introduced on which the lecturer has so rightly animadverted, of withholding from the man who had served his Sovereign and his country something that was his due, and, to all intents and purposes, fining him for taking employment and robbing him in the performance of that employment, simply because he had done his soldier work as well. On one point I am very anxious, and this is that that scandalous abuse of deferred pay, of which both lecturers have made such emphatic mention, and in which they carried both audiences with them, should not be mixed up with the intention and right application of an indispensable provision, by which the soldier in the Reserve shall continue a soldier, a numerical reality and efficient, and yet induced and enabled to re-enter the grooves of a civil calling. I should like very much to get an answer from the lecturer to this point, whether he would not favour, by all means in his power, supposing such a thing were put into practical and positive form, the responsible employment of Reserve men under Government stipulations, such that they shall be able to be called up for training just as the Militia are, without loss of employment; that they shall be fitted for employment and ensured employment, applying to such purpose the money now spent with a folly which has brought odium on a provision necessary, but never yet applied, and so, practically speaking, never really made, but squandered with a prodigacy beyond bounds. I do not altogether feel as if the increase of the Reserve pay to 8d. a-day, or to any other sum, would entirely meet this object, as Colonel Graves supposes. I should like to engage his attention to this point, not for an immediate answer, but that he should well weigh his proposal in the light of the use to which the typical Reservist now puts his retaining fee. And for this reason I will give you an example, if I may, from what has happened to me within a few days. A man dropped from the clouds, if I may so say, some six or nine months ago, whom I had never seen before. He had heard of me from some one else, and came to place himself in my hands to get work, and for me to help him, if I possibly could, to cure his tendency to go on the booze. He placed himself altogether in my hands; he was a very useful all-round man, of singular intelligence, and above the average ability. He had been trained as orderly-room clerk, and was a good workman besides. So far as concerned the struggle with his strong temptation, he seemed to go on admirably for about six months; but I then knew

that there was something going to break down. Instead of coming to me to sign his paper, he slipped off. In forty-eight hours all his Reserve quarterly pay was gone, his clothes were pawned, and he was knocking at the door for shelter. Now I am afraid the course of the Reservist is very much like this, when he has had his first great deferred-pay booze, he goes first to the barrack room and sponges slightly ; there he is very kindly treated ; he afterwards finds old Officers under whom he has served. I was in the Royal Engineers, and the Indian Engineers were at that time entirely distinct, so I never went to India ; but the number of men who have served under me in India is quite wonderful. They remember me perfectly well ; only unfortunately I have not been to any one of the places where they have served under me. This sort of thing very soon leads to begging and lying from door to door. Now, I want to cut at the root of the difficulty which leads to these great evils, which do so much to injure the true soldier at the other end of the scale. One of the leading temptations to the Reservist's downward course is that distaste and disability for civil manual occupations which prompted him to preference for the soldier's life. When a man joins the Reserve he has immediately got to look out for himself, instead of having to look up to others. There is a class of Reservists and Reservists. The good men are not the cause of any trouble ; it is the bad or the indifferent who go downwards, and must be under control if they are to be helped to better ways. Can you wonder that he fails when the three conditions in which alone he is under that control, and in which the State supports or assists him, are that of the soldier with the colours, which he has just been induced to relinquish, that of the pauper, and that of the gaol bird ? Towards these he gravitates as by a natural law. But ensure him employment, keep him under such control as may be necessary to link maintenance and work indissolubly together, and things only need to be rightly administered to ensure the result. I am thoroughly persuaded that the remunerative employment of, and the recovery of a great many of those men can be absolutely secured. The application of deferred pay or its equivalent to these, its apparently intended, purposes will, I believe, be the much better way of applying it than to allotting it, that the Reservist, if he will, shall, in the course of five years, have twenty boozes, instead of having one big one at the beginning, then twenty lesser ones, and in either case going into the union or into gaol at the end. I need not say how thoroughly I have been delighted with the lecture, nor how much I thank Colonel Graves for giving his attention to a subject that is all-important if conscription is not to prevail.

Lieutenant-Colonel WHITTINGTON : You have all heard from the regimental and from the combatant part of the Service here, about Reservists. I thought a few words from myself, having been a Paymaster for the last eleven years, and having seen a great deal of the Reserve, having mobilized and demobilized them three times, and having been in Bury, which is one of the worst parts for the Reserve, for they are always passing through there to tell you what a wretched state they are in, might be of some advantage. I do not think you have any idea of the distress of some of the Reservists who are knocking about the country, particularly in the north of England. I have seen them without food, no doubt for several days, sleeping under ricks and hedges, going to the casual ward, and tramping from one part of England to the other. Ask any of them, and they say they would give anything to return to the colours again, but there is that one thing, they cannot go back unless they'll pay 18*s.* or 21*s.* A man starts first of all in this way, we teach him to be a smart fellow, to be cleanly in his habits, and we, in every way, try to make a better man of him, and at the end of seven years we undo it almost in one day. We give him 21*s.* to spend in drink, we send him down to his village in a suit of clothes that he is utterly ashamed of, we do not even allow him to buy a better suit to go down with. My idea is you cannot do away with deferred pay at once, if you do away with it eventually, but you must do it gradually. All men serving, remember, have vested interests, and they must be met. Every man now serving must have his deferred pay. Although they must have that deferred pay, I would give a man who has, say, 3*l.* coming to him, 1*l.* down, and let him spend the 2*l.*, if he wished it, in clothes. I would give a man who has 21*s.* coming to him, two suits of clothes, if he like to buy them, producing the bill from the tailor he has purchased them from, and I would give him the remainder

by instalments of 1*l.* a week until it was spent. By that means you would give him time to get to work, and you would prevent his spending the 21*l.* in drink.

Colonel GRAVES : That is for the vested interests?

Lieutenant-Colonel WHITTINGTON : Yes. To induce men to go into the Service I would offer greater advantages, by what I would call good service pay at certain periods. I would treat the recruit for the first year as an apprentice, and then I would increase his pay. I would make more warrant officers—I think that would be a great inducement to men to stay—and I would always let a man come back from the Reserve, if he liked within a year, to the colours without paying anything back again. We want these older men to keep the young fellows in order. Look at the boys we have in our regiments; no one to tell them anything. I remember when I was a youngster that even old soldiers would come to me to ask my advice as an Ensign, and I am sure very often they could tell me a great deal more than I could tell them; but I was an Officer. Upon my word I do not think that ever happens now. I do not think there is the same feeling between the soldier and the Officer as there used to be; I think it is gone, and it is because we see them for such a short time.

The CHAIRMAN (Sir Arthur Herbert) : It is so late, and you have heard so many speeches, I can only say a very few words. There is one thing that strikes me as rather an anomaly in the lecture, although the greater part of it I agree with entirely. It is stated on the one hand that the Reservists have caused enlisting to be disliked, and on the other hand it is said that the number of men who offered their services as soldiers in 1886 was actually as many as 75,000, a much larger number than ever offered themselves before. There may be some explanation of this; but I cannot say that I quite understand the two statements. That the soldier is better off than the civilian of the same class, there can be no doubt. I take a great deal of interest in the employment of Reserve soldiers, and whilst attending the Committees, I constantly have before me men who wish to obtain situations. The other day a fine young man, for whom a situation as goods porter on the Great Northern Railway had been found, told us that on his wages, 1*s.* a week, he was not nearly as well off as when in the ranks; that for board and lodging he had to pay 14*s.*, leaving only 1*s.* a week. He said, "If it was not for my Reserve pay I could not have lived on that." The difficulty we find in our Association is not so much in procuring situations for good, steady Reserve men as in finding the men qualified to take these places. Every week when I attend the Committee, four, five, or six men are brought up for whom we have obtained situations, and who have either left them or have been complained of. This is not the fault of the Government, or of the Association; this is the fault of the men. So long as men from the lowest class are enlisted, loafers who have never done a day's work, boys who have hung about public-houses, earning a shilling here and sixpence there, it cannot be expected that when these men return to civil life they will be able to find remunerative employment. No doubt they have improved in physique and in behaviour while under discipline, but they never liked work. They are, however, better off and have more chance of employment than before they enlisted. In some cases no doubt, the Reserve pay is a great bane. An employer of labour in London who has nearly 600 ex-soldiers in his employ, not all Reserve men, but men who have served in the Army, told me that one of his great difficulties was with the Reserve men, because they earned fair wages, which they gave to their wives and families, but when the Reserve pay came in, they considered it as a sort of pocket money to be spent in a lark, and they absented themselves from their work. He said that his foremen stated that they trusted he would not take any more Reserve men for the above-mentioned reason, though they do not object to men who have finished their time, and are often glad to get them. The fact of the money coming in suddenly once a quarter renders the men very apt to break out. I could go on for an hour and a half on this subject, but I am perfectly sure you are already tired; therefore I will now call upon Colonel Graves to answer any remarks that have been made by the gentlemen who have addressed you.

Colonel GRAVES, in reply : I am not here to-day, as it were, to argue the point with those who differ from me in what I have said. There are several suggestions put forward in the discussion which may or may not be better than the proposals

suggested by myself. I am not going to have it out here as to which are the best. The main point I had in my mind was to take, if I might say so, a large view of the matter, and to leave out the details, so as to raise the question from the wider view of the case (therefore including the less) so that one would extract during the discussion proposals which might be better possibly, and probably, than mine, so that there might be a general choice made, or a comparison instituted, from a greater number of suggestions being put forward. For instance, General Dashwood, in his remarks, spoke about enlistment being for seven, fourteen, and twenty-one years, with a deferred pension at the end of twenty-one years. Deferred pension and deferred pay should be, I presume, lumped together in a sum and distributed. General Dunne also suggested a permanent pension at the end of sixteen years.

General DUNNE : I suggested that it would require one.

Colonel GRAVES : I think myself a man who has come to twelve years' service, if he has a good character, ought to be allowed to go on for the twenty-one, and that would settle that question. Then came the question as to the profit of the canteen being a temporary measure. Quite true, as we have done with regard to the reduction of the grocery charge. If I get profits on the canteen only to go to the reduction of one halfpenny I reduce one halfpenny, if only one farthing I reduce one farthing, and so on. It is a matter which depends upon the depth of the canteen breeches pocket. There were some points brought out by General Dunne with regard to the employment of Reservists, as a general rule, in all Government offices and employments. I do not anticipate anything of the sort, and I should be very sorry if I left that to be understood. It is impossible that all appointments should be filled by Reservists; it would bring about smash. But here I do want it very particularly to be understood that the British taxpayer is now paying a man for doing potman's work in a canteen while he thinks he is paying him for soldiering. They should not take a good dragoon, hussar, or infantryman and make a canteen potman of him. Again, we have our men taken away from duty for cooking purposes. I maintain, it is not the dragoon's business to put a bib and cap on and make puddings; it is his business to fight with the sword, and our Reservists should be put in to cook. The taxpayer in these cases is paying for men to cook when he thinks he is paying the soldier to fight.

General DUNNE : Having commanded a regiment sixteen years, I agreed *in toto* with every word you said. But I said it would mean extra pay. You would have to pay 10 per cent. more men in every regiment if you employed Reservists for the purposes of doing all these various duties.

Colonel GRAVES : My contention on that heading is this, that the taxpayer is already paying this man money for doing another person's job, and that the taxpayer should pay that 10 per cent. extra—if he is 10 per cent.—and fill these positions with men who are not supposed to be soldiers actually on full duty. Regiments should not be robbed of fighting men to supply grooms for remount depots, for Sandhurst, and Woolwich, and as clerks, &c. Now the Government, I am glad to say, are doing something in the right direction. I have in my hand a letter from an Officer who is employed in the Royal Engineers Office, in London, and I am glad to find they are employing for the pulling down of barracks in the Home District 80 per cent. of old soldiers under the Engineer Department, and Reservists. They are employing unskilled labour in demolishing Regent's Park Barracks. I did not, I confess, quite clearly understand the alternative Reserve system that Captain Pearce put forward, but, at the same time, I am thankful it will appear in the Journal, and the readers of that publication will be able to judge between the two schemes. With regard to what Colonel Whittington said as to vested interests, I would go a little further, and add to what he has said, and I would give those who have vested interests in the ranks, option as to whether they will have deferred pay, as he suggests, or have it at 8d. a day. I am not bound to explain the paradox our gallant Chairman has put before me; I simply take the facts as I find them, and do not profess to be able to explain the cause of the large increase in offers for soldiering, further than to say we require three times as many as formerly, and to again refer to the congestion of population in industrial districts. With regard to soldiers owning their clothing and being in danger of selling it to civilians, and of having tramps going about the country

dressed up half hussars and half marines, I would put it in this way: no soldier ought to be allowed to sell his clothing to a civilian, and, on the part of the civilian, it ought to be made a misdemeanour to be in possession of any military clothing. When the clothing is worn out it should be sold into the Quartermaster's store, simply for its weight value as rags, to go to the paper mill. With regard to the question of the Reserve pay, which has been raised by one of the speakers, I would remind you that a very large number of them are having extra pay now at this moment, because there are a great many of them already on the poor rate. The British taxpayer is already, against his will, increasing the Reserve pay, I maintain in an improper manner, and in a way that is wasteful to the country, and what I want to do is to prevent that involuntary payment by increasing the men's Reserve pay. I thank you very much for the kind attention you have given me, and hope the discussion here to-day will produce effect in the right direction.

The CHAIRMAN: I beg to tender to Colonel Graves our unanimous and sincere thanks for the very interesting lecture we have just heard. I do not entirely agree with some things that he has said, yet I think the lecture will be most useful. Colonel Graves has thoroughly studied his subject, and has brought forward many proposals which I dare say will be considered by the official Committee about to assemble.

NOTE.

The numerous points to be touched upon, and the limited time at my disposal wherein to cover the great extent of ground involved in the subject of the foregoing paper, almost of necessity forced me to omit some facts and suggestions which might be thought useful.

I therefore add the following:—

I stated, in my reply to remarks made in the discussion, that I believed that many Reserve men are now actually in receipt of help over and above their Reserve pay, owing to their coming frequently on the poor rates, and receiving relief. Many more are little better than professional beggars tramping the country.

This can be tested very readily. Masters of Unions throughout the country should be called upon to furnish a Return quarterly for one year, showing the number of Reserve and discharged soldiers asking for relief. This Return should state relief given and cost per man, and would, I think, prove that many Reservists are now burdensome to the country in a way that is injurious to the man and to the Service generally.

With regard to the State's method of dealing with the pensioner and Reservist in matters of employment and payment for the same, the following piece of personal experience will speak for itself:—On the evening of the day on which I read the foregoing paper, I went to Brighton to examine the working of a soldiers' institute there, of which I am a trustee, and there met one of the Royal Engineers. He had cycled over from Portsmouth to spend a few days on pass. He informed me that his seven years' service was nearly up, and that he would pass to the Reserve. I asked him why he would not extend his service for pension, and he said "Oh! Sir, pension is no inducement now." I said, "Why?" He replied that both civilians and the Government expected a pensioner or Reservist to work for less wages than an ordinary civilian, and stated that a large number were employed on the Government works at Portsmouth, and that all pensioners having 1s. per day pension received but 13s. per week, where a civilian doing the same work received 1*l*., and so on in proportion. The truth of this man's statement can be easily tested.

I think it is reasonable to urge, especially in the face of recruiting difficulties, that the man's pension is remuneration for work done in the past, that the Reservist's pay is given him as a lien upon his services in case of national crises, and that in neither case should it be considered as part payment for labour in the present or future.

On the subject of the general ignorance which prevails among the industrial population concerning the actual condition and emoluments of the soldier while serving in the ranks, I would suggest that strong cardboards should be issued to all free libraries, mechanics' institutes, and soldiers' institutes, as well as to all post-offices in the Kingdom, setting forth in full the emoluments in money and in kind received by the soldier on one side, and a correct detail of all stoppages on the other, and showing at bottom the weekly average balance credit of "pocket money." These cards should set forth the soldier's prospects also. This part should be expressed in what is termed "popular language." A cardboard 12" x 12" would amply suffice.

There are a number of Societies now doing good work in registering Reserve and discharged soldiers for employment in civilian life; they have an uphill fight, and require increased support. I think their work would be very much helped were there a closer concordat and a freer intercommunication between them and the many soldiers' institutes now established and on the increase.

In the discussion, one speaker expressed disappointment that I had not formulated a far-reaching, drastic scheme, the adoption of which would have settled the whole of our difficulties. I admit, I have in measure thought out such a scheme, but I am bound to say I think it would have done more harm than good to have promulgated it. I don't think the country is ripe for a great change yet. I believe great changes must come; but I believe in "progress" rather than in "precipitation." If we can progress and improve our present system so as to overcome our recruiting difficulties, even for a time, then these changes may be postponed. I believe these changes must come eventually, owing to educational and economical tendencies now gaining ground and gathering force. But for the present I would simply say, in conclusion, "*Tout vient à qui sait attendre.*"—F. J. G.

3rd May, 1891.



Wednesday, April 22, 1891.

ADMIRAL SIR THOMAS BRANDRETH, K.C.B., Member of
Council, in the Chair.

**HEAVY GUNS AND HEAVY SHELLS VERSUS LIGHT
GUNS AND LIGHT SHELLS, WITH SOME REMARKS
ON THE ARMAMENT OF HER MAJESTY'S SHIPS
"VICTORIA," "SANSPAREIL," AND "BENBOW."**

By GEORGE QUICK, Fleet Engineer, retired.

POPULAR opinion having taken a turn adverse to heavy guns and their employment on board ship, I beg leave to say something on the other side of the question.

The object of this paper is to provoke hostile criticism and to procure an ample discussion of the great question of the present moment and of the near future—the respective merits of heavy and light guns and shells, for future warfare.

If the facts and arguments of this paper can be demolished by other facts and other arguments, they certainly ought to be demolished, for it is only the true, the strong, and the good that should survive in this battle of the guns. No mercy should be shown to anything that is adverse to our fighting efficiency, and no mercy is expected for any fallacies which may appear in this paper.

As one of the early advocates of quick-firing guns, or, rather, I should say, of quick-loading guns, I am not disposed to undervalue their efficiency in the least degree, but rather to strongly advocate quick-loading for our heaviest guns. But I very much prefer heavy and really powerful guns to small guns, however rapidly the latter may be able to fire for a few minutes; and, therefore, I am opposed to any alterations being made in the three great ships, "Victoria," "Sanspareil," and "Benbow," to fit them to carry smaller guns than they have at present.

It is not possible for me to approve of the general design of any English or foreign heavy guns, for similar faults characterize all of them. But I strongly advocate the employment of very heavy guns, if they are properly designed and properly constructed, because their power for destruction is so much greater than that of an equal weight of small guns, as I shall endeavour to show further on. Nevertheless, there is an admirable mean in this matter of size and weight and number of guns to be carried on board ship, which should give us the

greatest power of destruction with the greatest resistance to disablement, and at the least possible cost for guns, mountings, and ammunition, as compared with their power of destruction. That golden mean lies somewhere between, say, an armament consisting of one very heavy gun, with its mounting, protection, and ammunition, and another armament consisting of 100 small guns, which, with their carriages, protection, and ammunition, shall equal in weight the one very heavy gun and its accompaniments.

I cannot but think that the Board of Admiralty, in February, 1889, arrived at the very best conclusion possible in fixing the number of heavy guns to be carried by our heaviest battle-ships at four (and no more and no less), divided into two independent batteries. But it would have added much to the destructive power of the ships and to the safety of the guns in action if the weight of the guns had been increased to 75 tons each, the calibre remaining 13·5 inches as at present. It is altogether impossible to have a very strong gun, and at the same time a light gun.

It must not be assumed that power and strength are synonymous terms where guns and machinery are concerned. Nor is mere circumferential strength, such as is provided in the wire guns, the only kind of strength required in naval guns. Wire guns and guns with short hoops may have great circumferential strength, but yet be dangerously weak longitudinally, and dangerously fragile and not repairable if struck by projectiles. Moreover the increase of weight of the 13·5-inch guns to 75 tons would have not only increased their power of destruction, but would have increased their power of resistance to disablement by small projectiles, whilst adding only 32 tons to the present total weight of 1,420 tons of armament of the new battle-ships now building.

That heavy gun designing is no easy matter, I know, from thirty years' experience, but that it is possible to make powerful guns of large calibre, great strength, great durability, and quite fit for the rough work of war, I am convinced; that is if proper precautions be taken, and if we do not too closely copy the practice of foreign Powers, but venture to think out the matter for ourselves on a sound basis.

In the "Victoria," "Sanspareil," and "Benbow," we have three magnificently powerful vessels, perfect in all respects, except that their six heavy guns have proved weak and have bent in the chase. These guns are said to have cost 18,000*l.* each, or a total of 108,000*l.* for the guns of the three vessels; and because, owing to errors in designs, which were made more than seven years ago, these guns have failed, we are asked to abandon heavy guns for sea service altogether, and to alter these splendid ships, at a cost of nearly a quarter of a million each, and to confess to all the world that England cannot make reliable heavy guns fit for naval service, or trust her seamen to work them.

Before we give up our heavy naval guns it would be well to consider what our neighbours are *doing*, as well as what they are *saying*, about heavy guns. Germany, France, and the United States, are

preparing their factories to make heavier guns than they have ever made before, and it will be a curious thing indeed if they do not turn their heavy gun factories to good account for producing heavy naval guns, as well as heavy guns for coast defence. But I really do not see why England should not lead in this matter.

To put the matter in a merely sensational form, I will ask, What would be thought and said of the British Admiralty if it decided to arm our new ships with no guns heavier than the 9·2-inch guns, and if some time after it were found that some foreign Powers had many ships afloat armed with 50-ton or 100-ton guns? What a tremendous howl would be set up!

And here I may remark that news was published in the "Globe" of yesterday that the French Minister of Marine has arranged for the construction of some battle-ships of the largest size and heaviest armament, at the cost of 1,120,000*l.* each. It will be interesting to learn whether the French will restrict the heavy armament of these ships to 9-inch or 12-inch guns.

I am not going to defend the existing heavy guns with their complicated breech mechanism. As an engineer of some sea-going experience, I detest complicated and delicate machinery on board ship; everything in connection with the guns should be as simple as possible—but the heaviest sea-service guns can be "man-handled" if the breech mechanism and the mountings be properly designed.

In 1884 and 1886 I patented hydraulic apparatus for working breech mechanisms, by the single motion of one lever only, but I prefer to retain the power of working by hand, even if hydraulic gear be fitted. By referring to the drawing before you, you will see the breech mechanism of a 13·5-inch gun which has only one shaft, with a simple wheel or crank to operate it. *One man can open or close the breech with this very simple arrangement in less than ten seconds,* and as the powder and shot take some little time to reach the gun, it is obvious that these ten seconds are not an objectionable length of time, provided that all complication and possibility of mistake or breakdown be eliminated by the absence of hydraulic fittings.

It is easy to find fault with existing systems, and with our great gun manufacturers, but it often happens that the fault-finders are not prepared with any practical remedies or improvements. The designs on the board indicate that I have at least endeavoured to make some improvements, and I do not ask for any lenient criticism of them.

That there have been errors in the design of our very heavy guns is due principally to our bad habit of "following the French" in all these matters. The French guns were made with short hoops shrunk on the A-tube without any connection of the ends of the hoops longitudinally—and the French heavy guns of 70 tons weight blew their muzzles off; and our heavy guns, being made on the same disconnected-short-hoop system, bent in the chase only, instead of bursting; owing probably to our steel being tougher than the French steel; or the chase pressures in our guns may not have been so high as those in the French guns.

I propose now to show,—

- 1st. Why the 111-ton guns fail as regards rigidity and structural strength, and the remedy therefor.
- 2nd. Why all heavy guns suffer from such excessive erosion of the surface of the bore and consequent shortness of life, and the remedy therefor.
- 3rd. That heavy guns offer less target surface to the enemy's fire in proportion to their weight than small guns.
- 4th. That heavy guns have more power of destruction by shell fire than an equal weight of small guns possesses.
- 5th. That new guns of 16·25-inch calibre of equal power, but of much greater strength and durability than the present guns, could be supplied to the "Victoria," "Sanspareil," and "Benbow," at a cost of 25,000*l.* per gun, or 150,000*l.* for the three ships.

1st. *Why the 111-ton Guns failed.*—The stresses in heavy guns can be as well calculated as the stresses in small guns, and should be provided for by giving a corresponding amount of strength. Strength is to be provided by necessary modifications in design rather than by a mere increase in the dead weight of the metal employed in the structure. Because a certain design or method of construction gives satisfactory results in a 6-inch gun it does not necessarily follow that the same design will give good results in a 13·5 or 16·25-inch gun.

This fact is very clearly indicated in Rankine's "Applied Mechanics" (6th Edition, page 347, par. 315), where he states:—

"The gross load of beams of similar figures and proportions varying as the breadth and square of the depth directly and inversely as the length, is proportional to the square of a given linear dimension. The weights of such beams are proportional to the cubes of corresponding linear dimensions. Hence the weight increases at a faster rate than the gross load, and for each particular figure of a beam of a given material and proportion of its dimensions there must be a certain size at which the beam will bear its own weight only without any additional load."

This plainly indicates that the design of our large beams or large guns requires to be different from that of the small beams or small guns in order to obtain the necessary strength and stiffness.

Several years ago I called the attention of the Admiralty and War Office to the want of longitudinal strength and rigidity in our heavy guns; and again, in a letter I addressed to the First Lord of the Admiralty, on the 27th November, 1889, I stated:—

"I am, I believe, at discord with all other gun designers on this point of construction:—They say that the A-tube is and should be the backbone of the gun on which all the other parts should be built up. I say that the outside part of the gun should be the stronghold in which the A-tube should be supported, strengthened and protected from breech to muzzle. I also say that the A-tube and the outer chase tubes should be removable when damaged, so that new parts could be substituted. The A-tube has quite enough work to do in withstanding the heat, the friction, and the stretching action of the powder gas, and the wedging action of the projectile, which is necessarily experienced with every system of rifling."

Now, in the 16.25-inch guns the area of the cross-section of the bore, including the rifling, is about 209 square inches. The diameter of the A-tube at 16 feet from the muzzle, and where it is entirely unsupported,¹ is approximately 25 inches; and the net area of the cross-section of the metal at that part of the A-tube is only 282 square inches—that is at the junction of the ninth and tenth chase hoops, counting from the muzzle. At about 171 inches from the muzzle, at the junction of the eighth and ninth hoops, the diameter of the A-tube is 24 inches, and the net area of the section of the metal is about 244 square inches. At about 129 inches from the muzzle, at the junction of the sixth and seventh hoops, the diameter of the A-tube is 23 inches, and the net area of the section of the metal is about 206 square inches. At about 114 inches from the muzzle, at the junction of the fourth and fifth hoops, the diameter of the A-tube is 22 inches, and the net area of the section of the metal is about 171 square inches only. Thus in a length of 192 inches we find nine hoops, of a mean average length of $2\frac{1}{3}$ inches each, shrunk on the A-tube; but these short hoops are all disconnected at their ends, and they are therefore incapable of resisting the longitudinal extension of the thin A-tube; which extension occurs under the pressure of the powder gas; and they can render but very slight support to the A-tube in resisting the twisting effort of the rapidly rotating projectile of 1,800 lbs. weight, moving with a velocity increasing from 1,500 feet per second to nearly 2,000 feet per second. Is it any wonder that the thin A-tube, unsupported longitudinally by the chase hoops, bends as the projectile rushes up the bore and leaves the muzzle with an energy of 50,000 to 55,000 foot-tons, whilst every foot of length of the interior of the gun behind the projectile is subjected to a pressure ranging from 10,000 tons to 2,440 tons?

In the plan of construction I have advocated for some years past long tubes are substituted for the short hoops, and these long tubes are united together at their ends by strong steel nuts, or "screwed unions" on the outside of the gun, so that the exterior of the gun is formed into one rigid whole from breech to muzzle, so as to assist the A-tube in resisting extension and bending in every direction.

In the case of the "Benbow's" guns, by the substitution of these long tubes for the short hoops and the application of the "screwed unions" for connecting the ends of these tubes, the area of the cross-section of the metal added at the junctions of the tubes would be greater than the area of the sections of the A-tube, thus more than doubling the area of the metal to offer resistance to flexure or distortion of any kind. But the stiffness imparted to the chase by these "screwed unions" would be considerably greater than that due only to the increased area of metal, as the stiffness of a tube or hoop increases approximately as the square of the diameter. And the weight of these three "screwed unions" would be 900 lbs., 700 lbs., and 600 lbs., or just under 1 ton in the total.

¹ These measurements are taken by scale from reduced drawings, as correctly as the circumstances will allow, but this method of measurement is of course open to error.

But I do not recommend that these 111-ton guns should be patched up or altered for naval service, but that they should be strengthened and appropriated for coast defence purposes at one place only, such as Portsmouth, Sheerness, or Plymouth, where they could be repaired when required, and where all the necessary stores could be collected and kept together in one place.

2nd. Why all Heavy Guns suffer from excessive erosion of the surface of the bore and consequent shortness of life, and the remedy therefor.—It has been assumed that because all heavy guns firing large charges have suffered severely from rapid erosion of the bore and destruction of the rifling, this is an inherent defect which cannot be prevented. And in one of the official text books it is stated that “Speaking generally it may be said that erosion is due to fusion of the metal.”

I shall endeavour to show that means may be employed to diminish the erosion so that the life of big guns shall be prolonged; and that the durability of all guns should be in inverse proportion to their length, that is, if proportional or symmetrical charges be fired.

Thus, if a 6-inch gun, 20 feet in length, firing 50-lb. charges and 100-lb. projectiles, will endure for 1,200 rounds, then a 12-inch gun, 40 feet in length, firing 400-lb. charges and 800-lb. projectiles, should endure for 600 rounds. In the 6-inch gun the total area of the surface of the bore will be approximately 4,520 square inches; the area of the cylindrical or rubbing part of the 50-lb. charge will be approximately 658 square inches, or 1 square inch of surface of cartridge to 6.87 square inches of surface of bore; and in the 12-inch (supposed) gun with the 400-lb. charge the proportions are exactly the same.

The pressure in the two guns we know to be practically the same, and, so far as we can determine, the temperature of the gases on firing is practically the same. But the time during which the metal is subjected to the heat of the gas varies in similar guns only directly in proportion to the length of the guns, and therefore the erosive action of the gas should vary only as the length of the guns; and then the endurance of the guns would vary inversely as their length.

In the Armstrong and Whitworth gun competition in 1863-64, “After 3,000 rounds had been fired the bore of the breech-loader (Armstrong’s) was found to exhibit scarcely any signs of wear, except at the breech end.” This gun was fired with 9-lb. charges of “brutal powder” and 70-lb. projectiles. Thus the gun consumed 27,000 lbs. of powder and threw 210,000 lbs. of projectiles, and yet “was found to exhibit scarcely any signs of wear, except at the breech end.” The pressures were not registered, but we know that with the small grain powder then in use, and with the lead-coated projectile offering great resistance, the pressures must have been about 20 tons per square inch.

At the Bochum Steel Works, in Germany, the writer saw a 15-cm. breechloader which had fired 1,600 rounds and was still in perfectly serviceable condition. The projectiles fired from this gun had

copper rotating bands, which fact disposes of the assertion that injury to guns results from the use of such projectiles.

The copper rotating band is in reality the best gun-preservative we have at present, as it diminishes the rush of gas over the projectile; and, moreover, it adds largely to the velocity and energy of the projectiles with given charges of powder. Thus, in the 4-inch B.L. gun, 4½ lbs. of P powder gave a velocity of 1,000 feet per second to a rifled shot of 25 lbs. weight fitting the bore, the muzzle energy being 173 foot-tons. Whilst the same charge in the same gun gave to the same weight of projectile, but fitted with the service rotating band, a velocity of 1,313 f. s., and a muzzle energy of 299 foot-tons, or 72 per cent. more energy than that of the projectile which fitted the bore. The experiments of Sebert and Hugoniot, in France, show similar results. We cannot afford to lose this increase of power and economy of powder for the sake of employing projectiles which fit the bore mechanically and easily, and which would not prevent erosion.

Now the question is—Why did not the above-mentioned guns suffer from severe erosion? Some people may ascribe their endurance to the good quality of the steel which resisted the erosion, and no doubt the quality of the steel is a matter of importance, but I am of opinion that their great endurance arose from these facts:—1st. That the diameter of the chamber of those guns but very slightly exceeded the diameter of the bore, and that consequently the charges of powder were not of greater diameter than the bore, through which bore the unburnt powder and the solid and liquid residuum of the charges could be driven in a straight course without violently impinging on the walls of the bore, and thus cutting up the surface in the fashion of a sand-blast. 2nd. That in these cases the powder being of black, quick-burning material, was rapidly consumed, so that but a very small quantity of hard, unburnt particles of the powder was driven up the bore of the gun. 3rd. The heat evolved by the black powders was not so great as that produced by the brown powders now in use. With the old muzzle-loading rifled guns, even when there was a considerable amount of windage, the erosion of the bore was not so excessive until the guns were chambered and slow-burning powders introduced.

I, therefore, conclude that the excessive scoring of heavy guns arises only partially from the increased temperature of the gases, but principally from the tremendous battering or attrition which the surface of the bore receives from the unburnt portion of the very hard, dense, slow-burning powder; and that this battering arises from the charge being larger in diameter than the bore of the gun, and by the charge being ignited first at its rear end. In the 16·25-inch gun the charge, consisting of 900 lbs. of hexagonal prisms of hard, dense powder, is nearly 20 inches in diameter. This charge is fired at its rear end, and thus the front end of the mass is violently driven forward to crush its way into the 16·25-inch bore. It would be a very strange thing, indeed, if the bore were not heavily scored, and the rifling obliterated after a very few rounds by this combination of heat and excessive friction.

If the powder be properly designed to suit the gun there is not the slightest reason why the diameter of the chamber should exceed by more than *one inch* the diameter of the bore.

The excess of the diameter of the chamber over that of the bore should be only sufficient to secure easy loading, with safety, when the chamber may become somewhat foul. The powder charge should be in circular cakes not exceeding the diameter of the bore, so as to pass freely up it without battering the surface, and the cartridge should be made up with centering bands to support the powder in direct line with the bore, and to keep it clear of the hot residuum which may possibly remain in the chamber after several rounds have been rapidly fired.

With this arrangement of cartridge, the erosion of the bore would be very largely reduced even if the charge were fired at its rear end or along its whole length, as it would enter freely into the bore without striking the walls of the bore. But the writer has provided means whereby the flame from the primer can pass up the whole length of the cartridge from the breech end and ignite the front end of the charge first, so that the pressure of the gas produced immediately after ignition shall press the projectile forwards, and the powder charge rearwards, so as to prevent the unconsumed portion of the charge from being pressed up against the base of the projectile and the walls of the bore. This plan of ignition should result also in producing greater velocity of the projectile, as under the present plan of rear ignition, a certain amount of energy of the powder gas first produced is wasted in driving the unburnt powder up the bore of the gun.

Even with a very large chamber and with a cartridge much larger in diameter than the bore of the gun, if the ignition were effected first at the front end of the charge, the erosion of the bore would be much less than it is at present.

The writer has submitted designs for gun-preserving cartridges for heavy guns, and it is to be hoped that means will be taken to prolong the fighting life of our heaviest guns to a very great length.

[The writer is acquainted with the numerous plans for using internal tubes in cartridges which have been advocated for many years past, and is aware that no commensurate success has hitherto attended their use.]

3rd. *That Heavy Guns offer less Target Surface to the Enemy's Fire, in Proportion to their Weight, than Small Guns.*—The following table gives approximately the area of the surface exposed by the muzzle-half of naval guns from 6-inch to 16·25-inch calibre, as that part may be taken to be always exposed to the enemy's fire; although in turret ships only about two-fifths of the length of our present Service gun is so exposed:—

Table of Areas of Gun Target Surfaces.

Calibre.	Weight.	Area of exposed surface of one gun.	Area of exposed surface of 1,000 tons weight of these guns.
inches	tons	square feet	square feet
16·25	111	65·5	590
13·5	67	48·0	716
12·0	45	32·0	730
9·2	23	22·6	982
8·0	14	16·75	1,200
6·0	5	8·28	1,650

From which we see that the larger guns expose less target surface in proportion to their weight than the smaller guns do.

But it is frequently stated that very heavy guns can be easily put *hors de combat* by a 6-lb. shot; and it is reported that at Eastbourne, a 6-lb. Hotchkiss shell struck the chase of a 10·4-inch gun and penetrated into the bore; and that at Shoeburyness, a 9·2-inch gun was struck in the chase, and a bulge of nearly half an inch raised on the interior of the bore. But those shots struck fairly at right angles; and in action it is very unlikely indeed that such happy shots will be effected. The smaller the gun that is struck, the greater will be the damage, even if it be struck obliquely, and the more likely it is to be put out of action. The minimum thickness of the chase of a 16·25-inch gun is 5·7 inches, which has far more resistance than the 2·9 inches thickness of the chase of the 9·2-inch gun Mark V.

It is interesting here, again, to refer to the trial of the Armstrong and Whitworth guns in 1863-64. After 3,000 rounds had been fired from the 70-pr. guns, they were fired at by a 40-pr. B.L. gun at a distance of 40 yards. The official record states:—

"The breech-loader (Armstrong's) fired at was constructed with a coil and not a steel barrel. The first shot struck 2 inches from the muzzle, at an angle of 20°, and made a slight bulge in the interior of the gun. The second shot struck close to the same spot, at an angle of 35°, and broke off 3 feet from the muzzle of the gun. The Armstrong muzzle-loader was first struck 30 inches from the muzzle at an angle of 20°, and indented the exterior without damage to the bore. The second shot struck close to the same spot and cracked the exterior coil, but did not injure the bore. The third shot hit in front of the trunnion, at an angle of 85°, and cracked two coils, but did not injure the bore. The fourth shot struck 46 inches from the muzzle nearly full on, cracked the steel barrel and first hoop all round, and rendered the gun unserviceable."

"The Whitworth gun was first struck 38 inches from the muzzle, at an angle of 20°. The second shot struck nearly on the same spot at an angle of 35°. The third shot struck nearly full on the second hoop in front of the trunnions, and started it. All the shot made indentations, but did not injure the bore. The fourth shot struck on the chase 2 inches from the muzzle, and bulged the bore so that a shot could not be passed down it."

Of course the penetrative power of the 40-pr. Armstrong of those days was not as great as that of modern guns, but then the guns

fired at were very small ones in comparison with those now under discussion, and the firing was done with comparatively heavy shot at the very short range of 40 yards.

4th. *That Heavy Guns have more Power of Destruction by Shell Fire than an Equal Weight of Small Guns possesses.*—In attempting to calculate the relative destructive power of large and small naval guns, certain facts must receive attention, which facts are, however, frequently overlooked, at least by some writers in the public papers.

Now the total weight of small shells carried on board a ship of a given tonnage cannot be greater than the total weight of heavy shells carried on board a similar ship of equal tonnage. Thus, if only 200 shells of 1,000 lbs. each can be carried on one ship, then only 2,000 shells of 100 lbs. each can be carried on another ship of similar tonnage.

We have then to consider the destructive power of the 200 heavy shell in comparison with the destructive power of the 2,000 lighter shell; and we have to consider this question of destructive power under several aspects:—

- (a.) When the shell are fired against heavily armoured ships moving in action in the open sea.
- (b.) When the shell are fired against moderately armoured vessels in motion.
- (c.) When the shell are fired against protected vessels constructed on the subdivided or cellular system.

In these cases we have to consider at what range the battle will be fought before we can determine the number of projectiles that will strike, or the effective action of the shell. Will battles be fought at long or short ranges? The answer is, that the spirit of the individual Captains concerned will alone determine the distance. If the fight be kept up at long range, it is pretty well certain that all the armour-piercing ammunition of the vessel carrying the small guns will be expended without the other vessel being sunk, for at long range very few projectiles will strike "dead on" or normal to the surface of the armour plating, and still fewer will penetrate anywhere, so as to let in a large quantity of water. It will be no easy task to sink a modern vessel, except by the ram or torpedo, or by shells containing very large bursting charges. How little could our "Shah" do against the wretched little Peruvian vessel "Huascar," armoured with only 4½-inch iron plating, although the 9-inch 12-ton guns of the "Shah" had a theoretical penetrative power of 9·9 inches of iron at 1,000 yards range! In this memorable fight, in which the "Shah" had it all her own way, was proved (1st) the enormous protective value of even a very small amount of armour; and (2nd) the necessity for a very large excess of actual penetrative power in the guns, over the theoretical resisting power of the armour plates, to produce any serious or disabling damage to an enemy's vessel.

As a proof that it is not very easy to sink vessels by light gun

fire, it is recorded (although the reference cannot be verified just at this moment) that a derelict merchant vessel having to be sunk, one of our war vessels fired at her with 32-lb. shells as she rolled heavily in the sea, but that she could not be sunk for a very considerable period. And if guns be employed which have a penetrating power only equal theoretically to the resistance of the armour, very few ships will ever be sunk in the future by armour-piercing shell of small bursting charges, and not very many ships will be permanently disabled in even a long day's fight by light gun fire.

But in considering the question of size of gun for naval service, we must take into consideration what influence the ram will have in determining the size of gun to be employed.

Supposing a vessel to be, owing to defect of speed or steering gear, or from any other cause, in danger of being rammed, which size of gun will probably prevent the ramming from being effectively performed? Will numerous small guns with rapid fire prevent the ramming, or will it be better prevented by the discharge of two or four 1,000-lb. shells at short range? I do not think there can be much doubt that the heavy shells at short range would strike and disable the ram, and that the light shells would inflict but little more crippling damage to the ram than a volley of pebbles would to an alligator.

It is not probable that the effective resistance of armour plates will diminish as years go on, or that our possible enemies will abandon the building of strong armoured vessels to oblige us, even if we abandon heavy guns for sea service. But so far as past experience goes, fortune has always favoured the biggest guns, both on land and sea. Of course, no one would venture to propose trying the costly experiment of firing at one of our expensive modern armoured vessels a series of shells from all our guns, from 6-inch calibre to 16·25-inch calibre, to compare the effects produced thereby; but one may venture to surmise that, whereas several small shells would produce local damage of insignificant amount in various parts of an armoured or protected ship in rapid motion, that the explosion in one place of a single heavy shell, containing from 30 lbs. to 190 lbs. of burster, would produce such an amount of damage as to entirely cripple the ship and put her out of action altogether.

Now, it has been stated that the theoretical penetrative force of our chief modern naval guns, at a range of 2,000 yards, is for the 16·25-inch gun 29 inches of unbacked wrought iron; for the 13·5-inch gun 26 inches; for the 12-inch gun 18·8 inches; for the 9·2-inch gun 17 inches; and hence it is argued that—

"If we can at a reasonable distance penetrate 22 inches of good armour with something to spare, we possess, it is tolerably obvious, guns which are sufficient for most purposes." ("The Times," February 12th, 1891.)

But this is arguing on the assumption that all the projectiles will strike at right angles or "dead on" the plate. If projectiles strike at an angle of 60° on a wrought-iron plate one-third more energy is required for perforation than if it be struck "dead on." But if the

wrought-iron plate be just beyond the power of the gun, the projectile will glance off if it strikes at an angle of 60° . With steel-faced compound armour beyond the power of the gun, the glancing angle is about 65° . And if the projectile strike an iron plate at 45° , twice as much energy is required for perforation as is required when it strikes "dead on." With the recent improvements in hardening steel plates and in making nickel steel plates, still more energy will be required to obtain penetration, both when the plates are struck "dead on" or obliquely, and we shall have to trust more to the destructive power of heavy common shells or high explosive shells on the unarmoured portions of the vessels to effect disablement, than on perforation of the armour only. But the gun that can best penetrate the armour may also carry the best explosive shell, because it will be the biggest; and our guns might be made to act as armour-piercing guns and also as high explosive shell guns, if they be properly designed, and if we can free ourselves from following too closely past traditions and the practices of other nations.

Hitherto, this paper has discussed only the destructive power of naval guns against vessels at sea. We must now consider it under the following aspects:—

- (d.) When shells are fired against vessels sheltering in ports or harbours.
- (e.) When shells are fired against magazines, batteries, ports, dockyards, Government property, factories, or public works of any kind.

In these cases there will be a fixed target to fire at, the exact range may be soon obtained, and misses should be few and far between. Now we have to see what the relative effects of the large and small shells would be.

Several years ago, in letters addressed to the Admiralty, I pointed out that—

"The true power of a gun is not to be measured by the energy of a single shot divided by the weight of the gun only, but that the power is to be measured by the energy of the total number of rounds that the gun can fire in one hour, divided by the weight of the gun and its mounting and other accessories."

But although this method of calculating the power of the gun is right and true for guns firing solid shot, or armour-piercing shells only, this method of calculation requires some amendment or modification when we come to deal with common shells or high explosive shells. For the destructive power of shells does not vary simply in proportion to the weight of their bursting charges; but their destructive power varies approximately as the square of the weight of their bursting charges.

The following table shows the weight of the bursting charges of common shell of our service breech-loading guns, and the relative destructive power of each bursting charge, assuming that the power varies as the square of the weight of the burster.

Whether the true power of shells varies as the square of the weight of the bursting charge or not, it is very certain that shells are not of much use unless they can get well into the structure fired at, and explode there. If the structure be not completely perforated, only very trifling damage can be done by small shell.

Table of *Relative Power of Shell.*

Gun calibre.	Shell filled.	Burster.	Relative destruc-tive effect.
inches	lbs.	lbs. oz.	
6·0	100 iron	7 5	56 *
8·0	210 "	13 5	182
9·2	380 "	18 0	324
12·0	714 "	31 6	998
13·5	1,250 cast steel	82 8	6800
16·25	1,800 "	179 0	32,040

Now, it is easy to say that common shell will not be fired against armour plating with any effect, but the fact is, that common shells from the 10-inch muzzle-loading gun have perforated 5-inch armour-plates, and on 1st February, 1877, at Shoeburyness, a common shell fired from the 80-ton gun with a velocity of only 1,490 f.s. perforated an 8-inch wrought-iron plate, so that it may be concluded that common shell, even of low velocity, will perforate iron plates equal to half their calibre in thickness; and that such shells would prove tremendously destructive if fired against lightly armoured vessels, or the unarmoured portion of the heaviest armoured vessels; and that more extensive and permanent injury, amounting to total disablement, will be inflicted by their large bursting charges, in very many cases where 6-inch shell striking in large numbers will be almost innocuous.

We have now to consider what are the results of heavy shell fired at shipping in port, at dockyards, magazines, and earthworks. And we must bear in mind the great advantage that the heavier guns possess over small guns when firing at long range.

In vol. xiv, page 523, of "The Proceedings of the Royal Artillery Institution," it states:—

"An example of this kind of bombardment is given in the attack on Peruvian vessels in Arica and Callao harbours by the Chilean ship 'Angamos,' in 1879-80. She was armed with one long-range heavy gun, an 8-inch Armstrong of 11½ tons, and at the range of 8,000 yards did much damage to the dockyard and ships in harbour."

And on the same page we find:—

"Experiments with a 9-inch R.M.L. gun as a howitzer have shown that very accurate practice can be made at 10,000 yards range."

Now, the larger the shells thrown at very long range, the more likely are they to break into magazines, and to destroy works of

public necessity, such as gas and water works, docks, drainage works, &c., &c., and thus to produce such terrible distress amongst the civil population as to compel the military authorities to surrender the place, or to come to terms with the attacking force.

In the experiments at Lydd, in 1880, it was found that—

"The heavier howitzer has the great superiority in that it can form a breach in less than half the time taken by the other, and it requires a less total weight of ammunition than the lighter one; these advantages of the heavier howitzer are due to greater accuracy, increased shell power, and harder hitting."

Now, although there was so much difference in destructive power between these two howitzers, there was only a small difference in calibre—the larger one being only 8 inches, and the smaller one 6·6-inch calibre.

At p. 225 of "Mackinlay's Text-Book of Gunnery" we find :—

"The powerful shells of the 10-inch gun not only made craters 10 to 14 feet in diameter, but also shook the whole structure, and threw down the concrete in large masses. The bursting charges were 20½ lbs."

At p. 227 it states :—

"The great effect produced by the 10-inch shell in breaching a 30-foot parapet in two rounds is worthy of notice, and demonstrates the advantage of the employment of heavy ordnance when possible."

At p. 229 it states :—

"It was considered from the experience gained in 1883 that the best way to silence guns mounted in permanent or in siege works by frontal fire is by the employment of shells with the largest possible bursting charges, to destroy the protecting earthworks, as a gun showing above a parapet, especially at long range, is a target extremely difficult to hit."

It is almost unnecessary to argue further that the destructive efficiency of large shells is greater than that of an equal weight of small shells; but that the larger shells are more economical from a financial view may be seen from the following table, which has been compiled from the Official-priced Vocabulary and from the Treatise on Ammunition :—

Table of Cost per pound of Bursting Charge.

Calibre of shell.	Weight of burster in each shell.	Cost of 100 shell.	Total weight of burster in 100 shells.	Cost in pence per lb. of burster.
inches	lbs. oz.	£ s. d.	lbs.	pence
12·0	31 9	607 11 10	3156	46·6
9·2	18 4	331 6 2	1825	43·5
8·0	13 8	210 8 5	1350	37·3
6·0	5 13	162 9 3	581	67·1
5·0	4 12	94 14 1	475	47·8
4·0	1 15½	45 1 5	195	55·4

NOTE.—The price of the 16·25-inch and 13·5-inch shells is not given in the Vocabulary.

From the foregoing, it appears that the 8-inch and 9·2-inch shells cost less per lb. of burster than any other shells; but, as we have before seen, the destructive efficiency of every pound weight of the burster of large shells is very much greater than the destructive energy of every pound of burster in the small shell, and, therefore, that the money cost of the shells, to perform a given amount of destruction, is reduced as the size of the shells is increased.

To illustrate this matter by an extreme case, we may say that a thousand small shells may strike a well-protected magazine without exploding it; whereas if one heavy shell struck fairly, the magazine would be blown up; the heavy shell would therefore be cheaper to employ than 1,000 small shells.

If it be granted that guns of large calibre should be employed, both for sea service and coast defence, other important questions arise as to what will be the best weight of the projectiles and of the charges for these heavy guns.

On board ship not only are the weight and the length of the guns necessarily limited, but the weight and number of the projectiles carried must be very limited also. Again, the size of the magazine and of the passages from the magazines to the guns is very limited on board ship, consequently not only are the cartridges limited in number, but they are also restricted as to maximum length. In fact, small size of cartridge is more important on board ship than small weight of cartridge.

We have pretty well arrived at the conclusion that there is a certain relation between the weight and the diameter of the armour-piercing projectile which gives the best result at moderate ranges; and it is to be hoped that a uniform value for $\frac{w}{d^3}$ will be established for naval B.L. guns of all calibres of 6 inches and upwards. At present the value of $\frac{w}{d^3}$ varies from 0·41 to 0·508, but having regard to number of shell to be carried, facility of handling, penetration at effective naval fighting ranges, and to capacity for bursting charges and moderate recoil, it appears to me that the best value for $\frac{w}{d^3}$ would be 0·462 for all calibres of purely naval guns. Then, having regard to the size of the charges, and the number that can be carried at sea, I am of opinion that the charges should not be more or less than one-half the weight of the projectile, so as to secure the greatest economy, efficiency, and duration of fire. If, however, light draught vessels be built specially for the defence of our own coasts, or for the attack of an enemy's ports, then special guns and special charges may be adopted for such special vessels—such guns being of large calibre, great length, but moderate weight, to project shells having thin walls, containing large charges of high explosives, at considerable angles of elevation, by means of special powder giving very low pressure (say 2 to 5 tons per square inch) for a very long distance up the bore. It is now twenty-one years ago (before the outbreak of the Franco-German

War) that the writer first submitted some designs confidentially to the War Office for propelling very large quantities of explosives through the air for the destruction of towns, shipping, &c.; and from a rough copy of that paper a few extracts are given:—

"Believing that the best method of defence consists in the possession and use of the most powerful and destructive means of offence, I have given my attention to the design of weapons which shall be certain in their action, and irresistibly destructive in their effects. That such weapons must of necessity take the form of monster shells, or locomotive mines, containing from 100 to 1,000 lbs. of gunpowder; or other explosive, is self-evident; but the means of obtaining a high velocity for such shells or mines, either through the air or through the water, is not so clearly apparent; and the efforts hitherto made to accomplish this object have not been attended with success.

"But the desirability of throwing large quantities of explosive material to a great distance was duly appreciated during the Crimean War, when the Government of that day ordered the construction of the Mallet mortars, which mortars, however, failed in consequence of the use of a too-quick burning gunpowder. Many years before that period even, other proposals had been made to propel large quantities of explosive material by means of rocket composition. The first in the field in this matter was Sir William Congreve, who proposed the construction of shell rockets of 300 lbs. weight. Subsequently, in 1811, General Paixhan proposed to destroy ships by torpedoes, made in the shape of boats, and containing 400 to 600 lbs. of powder, which were to be propelled by a species of large rocket."

Captain Warner and others followed in the same direction, and in 1867 Sir Henry Bessemer patented ordnance for throwing shells, varying in weight from 1 ton to 10 tons, at moderate velocities, by means of air compressed by pumps actuated by steam-engines.

In very recent days we have had the efforts of Zalinsky, Graydon, and others, to employ compressed air for the propulsion of large shells of very small specific gravity through the air with very moderate velocity, but containing large charges of high explosives.

These later designs involve the use of steam-engines, air-compressing machinery, and various delicate mechanical devices in the instrument for propelling these light shells; and the shells themselves are fitted with long and delicate tails or guiding appliances for obtaining a moderate amount of accuracy of flight.

Now, I do not propose to make remarks adverse to these designs for the employment of compressed air, but will merely observe that I prefer to employ shells of considerable strength and specific gravity, without any tails or guiding appliances, and that such shells should be capable of being discharged with low pressure and slow-burning powder, not only from special light guns made for the purpose and adapted for special service vessels, but also that such shells should be capable of being discharged with accuracy from the heaviest armour-piercing guns. Those heavy guns would discharge, where necessary, heavy armour-piercing projectiles at very high velocities with suitable *high-pressure charges*; and for the destruction of unarmoured vessels, sand batteries, magazines, dockyards, &c., these same guns could use the large high-explosive shells and *low-pressure charges*. The objections to this proposal are obvious, namely, that it would lead to a complication of stores; that there would be danger from carrying

shells containing such large quantities of high explosives; and many more objections of a similar nature.

The principal answers I can make to these objections are (1) that the best way to protect our commerce is to destroy the enemy's cruisers before they leave port, and to destroy the ports in which such cruisers can be fitted out; and that the easiest way to destroy such cruisers and such ports is to use very large, high-explosive shells at long range if necessary, or at short range if the chance offers itself; (2) that as, in future, our fleets must be accompanied by fast steam colliers to supply coal, so also must they be accompanied by fast steam ammunition vessels to supply shells and cartridges, unless the offensive power of our fleets is to be seriously crippled for want of ammunition by the first naval engagement; and that these high-explosive shells may be carried in sufficient numbers on board such ammunition vessels without unduly curtailing the supply of armour-piercing shells and high-pressure charges; (3) that the shells I propose will have greater range, accuracy, and penetration than those of the pneumatic guns; and that there will be less complication of stores and less machinery required for their employment than will be required for the pneumatic system.

All these points require careful consideration during peace-time—for they will surely crop up during war-time, and will demand attention then, if they do not receive it now. It is impossible to go into these questions exhaustively or satisfactorily in a paper of this kind, but they are mentioned here to indicate that they have received some consideration by the writer, and that they require definite settlement as early as possible.

As regards land service guns, for the defence of our ports and harbours, the local circumstances have to be considered in each case:—(1) the area of sea space to be defended, and whether very long range guns of great penetrative power be required or guns of medium range, moderate penetrative power, and great shell capacity; (2) the amount of battery space available and its arrangement—that is whether it is better suited for the reception of a battery containing two guns of 100 tons each, or for the reception of batteries containing twenty guns of 10 tons each; (3) we have to consider what will be the amount of protection that can be given to the guns; that is, whether we can give more protection to the two guns of 100 tons each, or to the twenty guns of 10 tons each, and we have also to consider the cost of the armour protection; and, lastly, the number of men at our disposal to man the guns.

With our recently-acquired improvements in range finding, &c., there is much more now in favour of the heavy guns than formerly; and, as regards the supply of ammunition to guns on our own coast, the supply may be considered as practically inexhaustible.

If extremely long range and enormous penetrative power, with great accuracy and a flat trajectory, be required for the protection of an important port, there is no reason why guns of 60 calibres in length may not be employed with charges equal to the weight of the shell. Thus, for a 16·25-inch gun the projectile may be 2,000 lbs.,

the charge 2,000 lbs. of perforated cake powder, the maximum pressure 20 tons per square inch, and the length of the gun 81 feet. The weight of the gun would be, approximately, 200 tons, and the shell would have a velocity of 3,030 ft.-secs. (if we assume that the net efficiency of the powder will be only 64 foot-tons per lb.), and the penetrative energy will be equal to 2,500 foot-tons per circumferential inch. If we could get an efficiency of 80 foot-tons per lb. of powder the velocity would be 3,390 ft.-secs., and the penetrative energy of the projectile would be 3,100 foot-tons per circumferential inch.

It is easy to say that it is extravagant to talk of such a gun, but whilst I am not disposed to ignore the difficulties of manufacturing and working such guns, I am not disposed, on the other hand, to think that Englishmen are incapable of overcoming such difficulties, nor am I disposed to disregard the effect of such a "messenger of peace" on the stoutest armour-clad that is ever likely to be afloat. Please for one moment to estimate the effective range of such a gun, and compare it with the effective range, 2,000 yards, of the Brennan torpedo. We have no positive information as to the cost of the Brennan torpedoes, with the machinery for driving and steering, and the cost of the discharging chamber, but it is open to question whether the Brennan torpedo is more or less economical than the monster gun, that is, having regard to the efficiency of both.

We must try to look ahead, and I maintain that we should have shells to perforate hard steel-faced armour, even at a considerable distance, and to carry a heavy bursting charge through that armour, for the advantage of the strong shell carrying a heavy burster lies in this fact—that it necessarily possesses great perforating power by virtue of its weight, even at a moderate velocity, and that its explosion after perforation will have an enormous sphere of influence in irreparably disorganizing the steam, hydraulic, and compressed air pipes, and the electric fittings in any vessel that may be struck.

This is, however, only my own personal conviction. War alone, on a large scale, will settle this question practically—in the meantime the more it is discussed, the more likely is it that a right conclusion may be arrived at before the terrible experiments of war begin.

One other point regarding the economy of heavy and light guns in first cost. It is generally stated, and accepted as a fact, that large guns are more expensive than small guns. This is a popular delusion. As a rule the cost of the heavy guns per ton weight and per ton of energy of projectile is much less than the cost per ton of light or small guns. According to the "Vocabulary of Stores," the No. 2 Balance-sheet or contract price of our guns is as follows: the cost per ton I have calculated therefrom:—

Table of Cost of Guns.

Calibre.	Marks.	Weight.		Total cost.	Cost per ton.
inches	No.	tons	cwt.	£	£
16·25	—	111	0	19,500	175
13·5	I, II, III	67	0	13,680	204
12·0	IV, V	43	0	8,778	204
10·0	II	28	0	6,042	215
9·2	IV, V	22	0	4,816	218
8·0	VI	14	0	2,736	195
6·0	III	4	9	1,069	240
6·0	V	5	0	950	190
5·0	II	1	16	568	315
4·0	III	1	2	421	382
3" (12-pr.)	I	0	7	308	880

If we calculate the cost of gun mountings and of the armour required to give a definite amount of protection to the guns, it will be found that the first cost of the mounting and protection of the heavy guns is less than that for the mounting and equal protection of an equal weight of small guns. For small guns require as thick armour to protect them as large guns do, although the small guns do not receive it.

We now come to my last proposition.

(5th.) *That new guns of 16·25-inch calibre of greater power and of much greater strength and durability than the present guns could be supplied to the "Victoria," "Sanspareil," and "Benbow," at a cost of 25,000*l.* per gun, or 150,000*l.* for the three ships.*—Here we come upon very debatable ground. The advocates of small guns have this great advantage, that they can say that the big guns have proved weak, that they have not been durable, and that it is extremely difficult, if not impossible, to make very heavy guns strong and durable, in consequence of the difficulty of shrinking long tubes on the A-tube so as to make close junctions.

The objections to the employment of long tubes, in lieu of short hoops, are partly financial and partly manufacturing.

The financial objection is, that short hoops cost less to make than long tubes, and that if any defect is discovered in a short hoop during the processes of boring, turning, hardening, annealing, or shrinking on, the loss is not so great as when a long tube proves defective, and has to be rejected.

As improvements take place in steel castings, in forging, tempering, and shrinking, the above objections should lose weight and importance as time goes on; and further, it is obvious that no reduction of cost in manufacture can be a true economy which results in the production of a weak or unreliable gun.

The next objection is, that the operation of shrinking on of long

tubes is accompanied by great danger and almost insurmountable difficulties, which practically prohibit their employment.

No doubt the internal tube of the gun is increased in length by the tremendous pressure of the outer tube; and no doubt the tube that is shrunk on contracts in length in the process of shrinking on.

But the amount of the extension of the length of the inner tube and the contraction in length of the outer tube can be calculated and provided for. These extensions and contractions need not prevent the close junction of the ends of the tubes, nor need they have any detrimental effect on the strength, stiffness, and durability of the gun. The question will be naturally asked, How is this difficulty to be overcome?

But to that question I must decline to give an answer under present circumstances.

The method of securing great longitudinal strength and stiffness, by means of the "screwed unions" on the outside of the chase tubes I have already referred to, but I am not at liberty at the present moment to give details of the method of applying those "screwed unions" to obtain the best results therefrom.

My contention is, that guns of greater length than any now in existence can be made with all necessary strength and stiffness, if they are properly designed and constructed; and that by a proper adjustment of the size of the chamber to the diameter of the bore, and by the use of suitable cartridges, the life of the heaviest guns may be very much prolonged.

We come, lastly, to the question of the breech mechanism for heavy guns. It is a subject on which I have but little to say. It is thirty-two years ago since I designed my first breech-loading gun, and in the course of the last eleven years I have taken out about a dozen British patents for breech mechanism and improvements therein.

More than ten years ago I was advocating the use of a "*Single-Motion*" breech mechanism, which should be extremely simple in its operation; and my views on the matter I communicated officially to the Admiralty and War Office, and they were expressed in a pamphlet which I published in 1887.

Ten years ago these views were received by many people with a considerable amount of ridicule, but I venture to repeat them again.

"I hold that it is essential that the men who have to work the guns in action should be studied as well as the metal of which the guns are made. We cannot drill men with shells exploding around them and with human bones and blood flying about, so as to produce the circumstances of real warfare, and thus to be enabled to select those people who can keep perfectly cool under such circumstances, and perform numerous complex mechanical operations with precision and rapidity. That there are such people I admit, but they are not numerous, nor are they easy to discover. For not unfrequently . . . the man who is very cool and precise at drill, under ordinary circumstances, will *lose his head* altogether in moments of emergency.

"After the highly trained and skilful men have been killed off or disabled in action, will it be possible for these guns (the French breech-loaders) to be worked satisfactorily by the other members of the ship's company? With a breech-loading system requiring only *one motion of one lever* to produce all the required

movements of the breech and firing mechanism, it is obvious that the maximum of simplicity, safety, and rapidity of fire will be attained."

On a recent visit to H.M.S. "Nile," I could not help thinking of the large staff of mechanics that will be required on board that vessel to effect repairs, after she has been engaged for a short time with a similar ship. And this question thrust itself upon me—What will be the value of the "Stoker-Mechanic-Gunner," whom we ought to have, but have not, as compared with the gallant Royal Marine whom we have?

Could we truly picture to ourselves the condition of our war-vessels and their crews during and after a fleet action, I think it would become obvious to most people that the complicated breech mechanism of the 12-inch guns (so well described in Lord Brassey's "Naval Annual," of 1886, at pages 172-174) should be replaced by mechanism of a more simple and more effective character.

I have now to call your attention to the drawings on the board, as they show some of my views on the subject of breech mechanisms. You will see that in the design for the breech mechanism of the largest guns the working is absolutely as simple as the turning of a grindstone handle.

I regret to say I am not a millionaire, and so I have not made and tried a 100-ton gun on this principle.

The only gun I have made was designed in 1884, and was tried for the first time in 1887, when the perforated cake-powder, which I calculated out for it on purely speculative grounds, was also tried. The results of some of the rounds fired from that 3-inch gun are given in a table at the end of this paper, which I will not trouble you by reading; but I may mention that the breech mechanism is somewhat similar to those shown in the drawings; that it is a single-motion mechanism; that a velocity of 2,250 feet was obtained with eight pounds of the black perforated cake-powder; that a charge of an experimental smokeless powder, of unknown composition, gave a pressure on two crusher gauges of 37 tons per square inch; that the chamber has not been measurably enlarged by the firing, nor the breech mechanism injured, and that the gun has not burst yet, although it is only 175 times heavier than its maximum charge, whilst the service 6-inch gun is 200 times heavier than its 55 lb. charge; the 13.5-inch service gun is 238 times the weight of its 630 lb. charge; the Hotchkiss 6-pr. is 400 times the weight of its powder charge, and the Nordenfelt 6-pr. is 330 times the weight of its powder charge.

As this gun was designed as far back as 1884, without any practical experience of gun or powder making, I do not think the results have been very bad for a first attempt.

In my later designs I have had the benefit of some little practical experience and much more time to develop them than I had in 1884.

I regret that I have had to postpone the trials of my experimental gun in a paper of mine which I have done so only to try

to show that purely speculative or theoretical calculations do sometimes prove to be correct in practice, although this has not been always the case in gun-construction.

Long ago we had the great bridge built across the Menai Straits, and in recent times we have had the Forth Bridge built without an experimental bridge being built to prove the system of construction and the truth of the calculations. And we build men-of-war, costing three-quarters of a million each, on new designs, simply on the faith of calculations. It is the same with marine engines, and I fail to see why we should not venture to build heavy guns on altogether new designs, if the calculations will only bear investigation and the designs promise definite advantages commensurate with the risk. I say it would be the truest economy to invite designs for heavy guns for our three grand ships, and that a Committee of Officers and scientific men should select the design on which the guns should be constructed. The designs having been selected, the inventor should be made to carry out his design, either at Woolwich, at Armstrong's, Whitworth's, or elsewhere, as he may select, and as the War Office may approve.

We will suppose, for the sake of argument, that six new guns be ordered to replace the present guns, and that to insure a large reserve of strength not only should an improved design be adopted, but also that an increase of weight should be given, so that instead of weighing 111 tons they shall weigh 120 tons each. This would add a total weight of 18 tons only to each ship, which is a mere trifle to vessels of 10,000 tons displacement.

I have no doubt but that Messrs. Armstrong, Mitchell, and Co. or Messrs. Whitworth would undertake to deliver these six guns within eighteen months of the date of the order, providing they were offered some premium for the extra cost of speedy production.

Say that the price of the guns should be 25,000*l.* each, if delivered ready for proof eighteen months after the date of the order; and that a premium of 40*l.* per day should be paid for every day short of eighteen months for early delivery of each gun; then there would be some inducement to manufacturers to incur the expense of overtime, &c., to hasten completion. Of course the guns would have to pass the prescribed tests before the premiums would be paid, so that there should be no danger from bad work arising from speedy production.

It would be infinitely better and more economical to pay high prices to capable manufacturers to secure really good and strong guns, than to stimulate the production of weak and cheap guns composed of short hoops not connected together endways.

In a former part of this paper I have stated my opinion that the present 111-ton guns should be removed from the three ships, and mounted for the defence of one of our great naval ports. But it is evident some great changes should be made in them to increase their strength and stiffness; and some alterations in their charges to procure much greater endurance of the bore. It would be scarcely desirable to go to the expense of mounting and protecting these guns on shore unless their strength and endurance can be largely increased.

Of course it would be an easy matter to bore out these guns, say to 16·6 inches diameter, and then insert another long steel tube to fill the chamber and bore. Then this tube may be bored out to 13·5 inches diameter, chambered and rifled; and then we should have fairly strong and powerful 13·5-inch guns of 38·8 calibres length instead of 16·25-inch guns of 22·2 calibres length. The length of our present 13·5-inch guns is 32 calibres, and the maximum charge is now 630 lbs. The charge, therefore, of guns of 13·5-inch bore, but 38·8 calibres long, may easily be made up to 756 lbs. of cake powder, which would increase the energy of the projectile by fully 20 per cent. The velocity would be 2,360 f. s.; the total energy = 48,380 foot-tons; the energy per circumferential inch = 1,141 foot-tons which would give a penetrative power at the muzzle of 47 inches of unbacked wrought iron. Thus the penetrative power of the gun would be greater than it is now, but its shell power would be less.

Now, why not go in for a bold experiment? Take the first of these guns when reduced to 13·5-inch bore; rifle it with a pitch of one turn in 15 calibres, and try some cast or forged steel shells of 6 calibres in length. This would be a bold stroke, and it has not been taken so far as I know, by the Japanese, Germans, Chinese, or French. But why should not we try it? By calculation and theory it can be done and ought to be done, and the only objection to it is this—that it has not been done by any foreign Power.

Of course there is the cost of re-rifling the gun, and reducing the size of the mushroom head and asbestos pad, but the stress on the breech screw would be reduced one-half by substituting a chamber of 14·5 inches in diameter for the present size; and, furthermore, the existing service 13·5-inch projectiles could be used, until longer shells were prepared.

The alternative plan is to retain the present bore and rifling. Then, to obtain durability of the bore, steel-bush the chamber so as to reduce its diameter from 21·125 inches to 17·25 inches. Turn down the outside of all the chase hoops to a true taper, force on long tubes, and connect them at their ends by "outside screwed unions." By this method of alteration, the gun charges would remain nearly the same as at present. The penetrative power may be increased somewhat, as the increased strength of the guns would permit larger charges or higher pressures to be used with safety, but, best of all, we should retain the shell with the largest bursting charge, and so retain more destructive power than we should do by reducing the bore to 13·5 inches.

I have avoided all reference to torpedo-boats, because I believe that they can be dealt with best by other torpedo-boats, and I cannot see that the torpedo influences the big gun question, although it certainly does influence the light gun armament, which armament is the outcome of the torpedo.

I have now to repeat that I court the severest criticism for these views, and that I have no doubt that it will be forthcoming; but I hope it will be remembered that our vessels must not only be able to meet those of an enemy, but that our vessels should be able to effec-

HEAVY GUNS AND HEAVY SHELLS

Trial of Single-motion B.L. Gun, 3-inch calibre. Travel of Projectile 26½ calibres.

No. of round.	Date.	Weight of shot.	Description of powder.	Density of powder.	Gravimetric density.	Weight of charge.	Velocity recorded.	Pressure per square inch.
No.		lbs.	S.P.		29 c.i. 0·956	lbs.	f.s. 1818	tons. { cruisers not obtainable.
11	1887 4/5	12·25		1·75		6·00		
16	do.	12·5	{ black perforated cake	1·75	22·3 1·243	6·5	2081	do.
17	do.	13·5	do.	1·75	do.	6·5	2080	do.
18	do.	13·5	do.	1·75	do.	6·5	2081	do.
19	do.	12·5	do.	1·75	do.	6·5	2094	do.
30	18/6	12·125	do.	various	22·5	6·125	2130	14
34	15/11	12·14	do.	1·75	1·23 do.	8·25	not taken	16 at base of shot.
41	1888 21/3	12·00	do.	1·71	26·6 1·04	6·00	2011	{ 16·8 at rear of chamber. 15 ditto.
50	23/3	12·00	do.	1·74	do.	6·00	2050	
53	do.	12·00	do.	mixed	23·63 1·17	6·75	2100	Not taken.
67	do.	12·00	do.	1·74	22·5 1·23	8·00	2250	{ No space for cruiser gauge. 13·7 at rear of chamber.
61	27/3	15·00	do.	1·75	24·61 1·126	6·5	not taken	

Trial of Single-motion B.I. Gun, 3-inch calibre. Travel of Projectile 26½ calibres—continued.

No. of round.	Date.	Weight of shot.	Description of powder.	Density of powder.	Gravimetric density.	Weight of charge.	Velocity recorded.	Pressure per square inch.
No.		Ibs.				Ibs.	f.s.	tons.
62	1888 27/3	12.00 { wide ring without cannelures	{ black perforated cake	1.71	22.85 1.213	7.0	not taken	17.9
77	18/5 do.	12.25 { rotating ring with cannelures	do.	1.71	23.27 1.19	6.95	2118	{ 23.2 at rear end of chamber.
78	do.	12.25 { do. do.	{ brown perforated cake	1.8	30.5 0.9	5.25	1435	Under 13.
110	10/12/89	12.00	{ smokeless (composition not known)	not known	52 0.55	3.00	under 800	{ 37 tons on two gauges at rear end of chamber.

tively attack an enemy's ports and seaboard at long range. And then I would ask whether thin armour and small shells are to be preferred to thick armour and powerful shell fire.

I have been able to say very little that is new on this very old subject, but as the tide is now against heavy guns, I have ventured to put forward the views I have held for the last thirty years, which views may be briefly expressed in a parody of an old legal couplet, thus :—

“In war, if you have not, you'll be a lame duck;
Big guns and thick armour, great speed and great pluck.”

Note.—Since the above paper was written, news has arrived from Valparaiso which appears to confirm, or at least to illustrate, some of the views therein expressed. In the “Times” of the 2nd instant we find the following :—

“A heavy shell from the ‘Blanco Encalada’ struck the ‘Florence,’ and blew her out of the water, her crew of 17 being either killed or drowned. . . . One shell from the forts penetrated the ‘O’Higgins,’ and another shell caused a gun on her quarterdeck to explode. When the smoke cleared away the deck of the ‘O’Higgins’ was found to be literally torn out by the shell. Nine of her guns and 12 of her crew were blown to atoms.”

The “O’Higgins” is a wooden vessel of 1,100 tons only, and the details of this affair are not to hand, but I think this event fairly illustrates what we may expect when unarmoured vessels are struck by heavy shell. This ounce of fact is better than a ton of argument.

Captain CURTIS : I should like to refer for a moment to the question of high-angle fire, which has been touched upon by the lecturer. I recollect that Lord Lyons and Raglan, at Sebastopol, were able to produce but little effect on the batteries by horizontal fire, inasmuch as the Russians repaired during the night what mischief we did during the day. The result was that 200 mortars were sent for, and placed on the land, and they had the co-operation of mortar boats. Directly they began to play on Sebastopol they had a very great effect, and the vessels that were lying in the harbour had to be protected by about four or five tiers of sandbags on their decks. I mention that fact to show that I think in the case of blockingade we shall not be able to do away with either mortar boats or vessels that carry guns suitable for high-angle fire. I recollect that from our ship we slung a gun on the fore-yard to an angle of 35°; the shot went to a tremendous distance, supposed to reach the Russian battery from our anchorage. Some of the guns on shore were also buried at that angle, and they fired a tremendous distance. Not only that, but you cannot tell where these shot are likely to come, as you can with horizontal fire.¹

Admiral BOWDEN SMITH : Having been detained at another meeting I was not present till quite the end of the lecture, but I would ask permission to say a few words on what was said after my entry. One of the questions brought forward by

¹ The English mortar boats operated from Streliska Bay. See Simpson’s “Sketches of the Crimean War,” plates 34 and 39, for the mortar batteries, also No. 13 for guns placed for high-angle fire. After Sebastopol was captured it was found the Russians had 32-pr. guns dismounted, and placed half buried and fixed at angle of 35° or so, which had annoyed our camp considerably nearest to the enemy; I believe it was the camp on Windmill Hill.—J. D. C.

the lecturer was big guns *versus* small guns. Now, I for one am very much against these big guns, and I should like to give the reason why, for I understand that it is proposed, not only to keep on the 100-ton gun, but to introduce a 200-ton gun. We know that guns burst or occasionally become disabled, and that has always been the case. In reading of former naval battles, we find that guns have burst or become damaged; but in the old days it did not very much matter, some poor fellows were killed and wounded round it, but it was only one or two, or at most 5 per cent., of the guns in the ship; there were others left to work. But now, if a gun becomes disabled, it may be your only heavy gun, or one of two. The other gun may be perfectly right as far as we know, but the men round the undamaged gun might not like to go on firing it. I do not wish to imply that the British bluejacket would not do anything required of him, but the steadiness of the remaining gun's crew would be affected if they knew the other gun had gone. I should be sorry to see a 200-ton gun introduced, believing that the 110-ton gun is already too large.

Admiral COLOMB: I think the reason why no one rises is because really the title of the paper does not correspond with its matter. We came here to listen to a paper on heavy guns *versus* light guns, which I, for one, understood must involve the question of few heavy guns or many light guns, which question has not been touched upon by the lecturer at all. On the contrary, the substance of the lecture, as far as I can make it out, is that it is possible to get increased power in the guns that you have without materially increasing the weight of the gun, or of the appliances of the gun. That is to say, you may put a more powerful gun into a smaller ship. But the title of the paper has nothing to do with this question. The question I was prepared to discuss was whether it is advantageous to have a large battery of medium guns or the present system carried to its extreme of a very large ship with only two 110-ton guns in her, as my friend Admiral Bowden Smith mentioned. The paper is mainly concerned with technical points of great complexity, which should have taken a paper by themselves to go into, with full drawings and explanations of what was meant. I have not myself carried away any of the details of the mechanism or exactly what was proposed to do, but I have carried away the fact that I have not heard any argument to show whether our ships ought to carry few very heavy guns or many medium guns.

Rear-Admiral W. R. KENNEDY: I should like to say a few words with your permission. I also came in with Admiral Smith at the fag end of the lecture, and regret that I did not hear more of it; but I quite agree with every word that has been spoken by Admiral Bowden Smith and Admiral Colomb. I think most naval Officers will be of opinion that they would rather command a ship with a few medium-sized guns than a ship with one, or even two, whacking big guns. They would get many more shots while the other man was trusting to his one shot, which might miss, and very likely would. As regards that remark about the "O'Higgins," I think that ought to be taken *cum grano*. I heard the lecturer say, and I certainly read myself in the papers, that one shot had blown up nine of the guns of the "O'Higgins," and twelve of the crew. I do not altogether believe that story. I am familiar with the ship "O'Higgins." Twelve years ago she was an old-fashioned gunboat, a good long gunboat, but I do not believe she ever carried nine guns; certainly, I should say six was the outside, and how one shell could have blown up nine of her guns and twelve of her crew is certainly a marvel to me, unless it exploded in the magazine and blew up the whole ship; so that I really do not altogether believe that story.

Mr. QUICK: I am very pleased to hear that which Captain Curtis mentioned about the howitzers and their effect. The system of mounting of heavy guns adopted by the Armstrong Company lately will admit of high-angle fire at 35°, which practically makes the present guns howitzers, and this is a very valuable point indeed. With regard to the 200-ton gun, it will be seen by reference to the paper, that I have proposed it for the protection of important forts, and not to mount on board ship. I should be very sorry to do so, unless we had 20,000-ton ships. I distinctly stated that the 200-ton gun was specially suggested as a competitor with the Brennan torpedo. I had not time to compare what would be the probable effect of a 200-ton gun with an enormous range and flat trajectory and great penetrative power with the Brennan torpedo, with its limited range of 2,000 yards only. As regards the

howitzers fire at Sebastopol, it is very important for us to remember what the British Navy has had to do in the old times, and to consider what it may have to do in the future. If we go back to old days, we may refer to the battle of Sinope, when the Turkish fleet was so smashed up by the heavy shell fire of the Russians. Then the cry was, "For God's sake keep out the shells," and I think after another naval battle we shall have to re-echo the same cry. But if we have good armour, steel-faced or nickel-steel armour, as the case may be, it will keep out the light shells, and we shall be able to laugh at moderate-sized guns. It is very nice to have several things to fall back upon, but you must run a certain amount of risk in warfare to attain any great end, and the question simply lies somewhere between the two extremes—whether we should have a ship armed with one heavy gun, or a ship armed with 100 small guns. I tried to put it that way as plainly as I possibly could in the paper, and for this purpose avoided all reference to the auxiliary armament; and I do not exactly understand why it is considered that I have not dealt with the question clearly as regards the number of guns. I think the Admiralty did wisely in selecting *four* as being the best number of guns for the main armament. Some people may say, why not eight? My contention is that four is about the best number of heavy guns you can possibly have—four heavy guns protected as much as possible; and then you have something with a crushing force, so that if you do get in a shot it may be an effective one—no peppering away, for hours together in the same old style as is narrated in James's "Naval History," when two frigates were engaged for the whole of the day—I won't be sure whether they were frigates or sloops—and at the end of the day's fight the only man wounded was the ship's cook, who received a contusion by tumbling down a hatchway! Let us know what guns we are to rely upon for our best battle-ships—I say 13½-inch guns, or possibly 15-inch guns, if we could only get the money to make them, and the money to build the 20,000-ton ships to carry them. But I would not advocate a single gun in a sea-going battle-ship by any manner of means, nor do I care so much for the four-gun ships. I certainly think for a heavy fighting ship, where you have to meet all sorts of vessels, four heavy guns are as much as the ship can carry besides her auxiliary armament. I think I am entitled to claim that there is some connection between my paper and the title, when I put as plainly as I possibly could the question whether there should be 100 light guns or one heavy gun on board a ship as the main armament, and then defended the four-gun arrangement in preference to any other. I am sorry I cannot agree with Admiral Colomb about the technical points. You may adopt the best general principles, but if the technical points are not well considered or carried out you may have your guns bent, and other disasters arise, which is very bad indeed. I do not think I have anything more to say about the matter. I will pin my colours to the four heavy guns for the main armament of our big line-of-battle-ships, and to very heavy shell fire to win the day in the future as it has done hitherto in the past.¹

Sir T. BRANDRETH: The only thing remaining is to thank the lecturer for the trouble he has taken in getting up this lecture, and in bringing so many points before us for thought. The gunnery question is an excessively difficult one, and an expensive one to experiment with. If we could only make more experiments, perhaps we might arrive at some more definite conclusions.

¹ With reference to the remarks of Admiral Kennedy on the armament of the Chilean ship "O'Higgins," it may be stated that in Lord Brassey's "Naval Annual" for 1886 the armament of that ship is given as three guns of 8-inch, two 70-prs., and four 40-prs. (all Armstrongs). In the "Naval Annual" for 1890 the armament of the "O'Higgins" is given as three breech-loaders of 7-inch calibre and four 40-prs. Whether any addition or reduction in the number of guns has been made recently is a matter of little account. The statement is clear that very great damage was done by a heavy shell, and those persons who are acquainted with Valparaiso know that the guns mounted on the fortifications are fairly heavy ones, especially if we consider them in comparison with the unarmoured wooden vessel "O'Higgins."

Some of these measures are due to local self-government with
respect to defence & addressing it directly to the country and
the people.

Friday, April 24, 1891.

MAJOR-GENERAL R. N. DAWSON-SCOTT, Commandant, School of
Military Engineering, Chatham, Member of Council, in the Chair.

THE USE OF RAILWAYS FOR COAST AND HARBOUR DEFENCE.

By 2nd Lieut. E. P. GIROUARD, R.E.

IN approaching the study of the coast defence of Great Britain, one is at once confronted with the vexed question of what the nature of the defence should be.

Innumerable books and papers have been written upon the subject, and yet no clearly defined principles to act upon are to be found. The general impression, however, after reading the more modern views upon the subject, is practically the same whether the mind dwell upon the influence of the sporadic raider, which some contend to be our only future foe, or upon the escaped squadron and the invading foreigner. All degrees of opinion unite in demanding some form of coast defence.

The opinions differ in the method of the defence only. None dispute the necessity of using guns and submarine mines or torpedoes for the local defence of our arsenals, dockyards, and unprotected coast towns ; though some differ as to the necessity of provision against invasion.

All admit the weakness, for a general local defence of the country, of our present system of coast defence. It leaves many of our commercial centres and coast towns quite open to the insults of an enemy. Everywhere on sea and land our present defence is admitted to be deficient in gun power. Even if our Navy were in the strength we all hope to see it, our coasts would, as defended at present, be in no condition of security from light attacks. What is urgently needed is gun power; gun power to ward off the raider from our unprotected towns and ports, if the Navy is at its strongest; gun power to ward off any attack until the Navy reaches that point; and gun power to prevent landings upon our shores. Is this gun power to be obtained by an extension of our movable coast defence? Naval authorities themselves say no; all ships must for the present go towards strengthening our first line of defence. Can this superiority of gun power be attained by an extension of fixed fortifications? Probably so at important points. But the extension of fixed fortifications of a modern type for the defence of every exposed point of our coast is an

utter impossibility. The cost of such an extension would be enormous.

Gun power must be obtained, if possible. A moving coast defence on the present system cannot be provided for it, and the cost of a fixed coast defence is prohibitive.

There is, however, another system, which I beg to submit to the judgment of this audience as being one of some considerable promise.

In Great Britain and Ireland we have systems of railways which are the admiration of the world.

Why not put this magnificent system to a practical use for the defence of the country, mount guns upon trucks which could travel on these lines and be fired from them?

Of the existence of the network of railway lines which cover this country, everyone is doubtless aware. Probably but few, however, have ever given a thought to the fact that they suggest the truest and most economical basis for resistance to any aggression or insult on our shores. Their construction was of course due to commercial reasons only. But physical conditions have determined for them in many places a course close alongside the seaboard, and thus they give us all the necessary elements for a powerful line of defence along the exposed portions of our coast.

By their proper utilization the country could be formed into one huge fortress, and prompt communication ensured between the parts. Such would be the elasticity of the system, that an enemy would have opposed to him at any exposed point of the coast the armament of a first-class fortress.

Before proceeding to any details of a proposed system for coast defence based upon the use of our existing railways, I should like to invite attention more especially to one or two points, which the foregoing suggestions emphasize.

Our existing system of coast defence by coast-defence vessels and fixed fortifications is an extremely partial one. It omits large portions of our coast line, whereas the system of defence here advocated is universally applicable to the whole coast line of Great Britain and Ireland. Moreover, it must be carefully borne in mind that ships and fortifications under modern conditions rapidly become obsolete, whereas our railways are always kept in excellent working order by the companies concerned without any expense to the Government, and are at the shortest notice ready to bring into action guns of the then latest and most improved pattern.

Practical Examples of Firing Guns from Railways.

Before proceeding to the details of a proposed scheme one important point must be discussed and settled if possible.

Can guns be fired from an ordinary line of railway with any degree of safety?

If the gun is to be fired in the direction of the line or at a small

angle to it, no difficulty exists. This method of firing guns is used in all arsenals for the proof of the heaviest guns in existence.

But the fire will undoubtedly have to be exercised over a wide area, and in most cases at angles to the lines, if not actually at right angles to them. Can this be effected with safety? Theoretically I am able to say, yes. Using as a basis the results of actual experiments it will be found that the 6-inch B.L. gun of 5 tons may be theoretically fired at a right angle to the line.

Not feeling that my authority for this statement would bear any weight, I asked Colonel Kensington, R.A., Professor of Artillery at the R.M.A., if he would kindly assist me. He has been good enough to go into the theory of the subject, and has consented to say a few words on it at the conclusion of this paper.

A series of very valuable experiments was carried out at the Camp of Exercise at Delhi in January, 1886, to test the practicability of firing guns at right angles to an ordinary line of railway.

The gauge of the railway on which the experiments were carried out (Rajputana Malwa Line) was one of 1 metre or 3'37 feet.

The gun used was the 40-pr. R.B.L. of 35 cwt. having a muzzle velocity of 1,180 feet per second.

The following trucks were requisitioned for the experiments:—

1. A 4-wheel wagon. Weight 2·87 tons. Length 13 feet 5 inches. Width 6 feet 3 $\frac{1}{2}$ inches.

2. An 8-wheel bogie truck. Weight 5·36 tons. Floor dimensions 25 x 7 feet.

The conclusions of the members of the Experimental Committee were:—

Mr. Jones, Carriage Superintendent, Rajputana Malwa Railway.

1. That 40-pr. guns can be fired with perfect safety broadside from either—

- (a.) Small empty wagons mounted on four wheels.
- (b.) Small empty wagons weighted up to 4 tons.
- (c.) Empty 8-wheel bogies.

2. That a bogie wagon weighted to 19·4 tons was perfectly stable when fired from broadside with a shotted 40-pr. gun. When so fired the deflection of the wagon bearing springs was actually less than half an inch.

Major Bissett, R.E., came to the same general conclusions as the above.

The success of the above experiments is very remarkable if the natures of the carriages, and the fact that no attempt was made in any way to reduce the energy of recoil, be considered.

The difference would, it is only just to assume, be even more remarkable if—

1st. A lower and heavier carriage, specially designed for the purpose, were used.

2nd. The recoil were taken up by the latest form of buffer.

3rd. The gun were fired from a 4 feet 8 $\frac{1}{2}$ inch line, in lieu of one of 3·37 feet.

If it be recalled to mind that the 40-pr. R.B.L. gun has a muzzle velocity of 1,180 feet per second, the following assumptions even without theoretical proof would not seem a lengthy flight of imagination. That presupposing the provision of a carriage specially adapted to the purpose, by the use of all modern improvements, the firing of a 6-inch B.L. gun having a muzzle velocity of 1,780 feet per second could be effected with safety from a standard gauge railway.

Proposed Organization for England.

It was my intention, after pointing out the practical possibilities of firing guns from railways, to give an outline of a proposed organization for the defence of Great Britain by the use of our existing lines.

From want of time I have been obliged to abandon my original idea, and limit this paper to England only.

The accompanying explanatory map (No. 1) of the proposed scheme as applied to England has been prepared on the basis of a range of 7,000 yards for gun fire and of 3,500 yards for machine-guns.

On this map the portions coloured red indicate water covered up to 7,000 yards by the use of the railway lines. The green represents the zone of light Q.F. gun fire (3,500 yards). The black the areas which are inaccessible by reason of the presence of natural obstacles, &c. The chain dotted line indicates the position of the 5-fathom line. The results obtained upon this map are of course purely of a theoretical character; undoubtedly cuttings and other obstructions in the field of fire would, in the event of a practical survey, be found to interfere in some places.

Starting from the Thames on this theoretical map it will be observed that that estuary, and with it the River Medway, are closed. Proceeding northwards, the first important point is the supposed favourable landing between the Rivers Crouch and Blackwater. To make good a landing at this point, only forty-five miles from London, an enemy must take advantage of a pocket or channel north of the Gunfleet Sand, called the Wallet.

Thence he could land between the Crouch and the Blackwater, and take up an excellent commanding position, facing London; or he might land in a less favourable position between the Colne and the Stour, on the beach of Clacton.

To reach the shore at the first-named place his boats would have four miles to row at low tide, to reach the second about three.

Within a range of 7,000 yards, as the map shows, the Wallet is to a great extent covered, and from an actual study of this particular piece of coast I am able to say that the practical limits of fire at this point would be identical with the theoretical results here shown. By a short extension of the railway from Clacton towards the south, the whole of the Wallet might be covered, and this dangerous point absolutely secured.

Leaving Clacton, the Stour and the harbour of Harwich are reached; these, being already defended, can be neglected.

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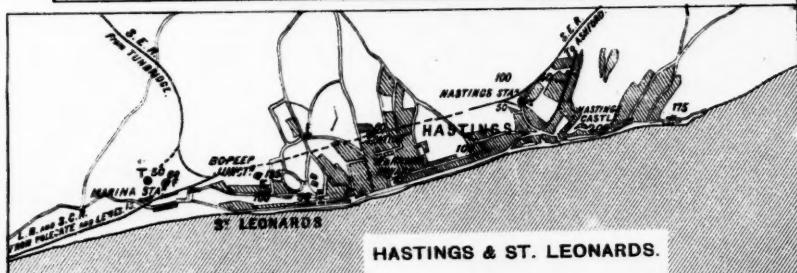
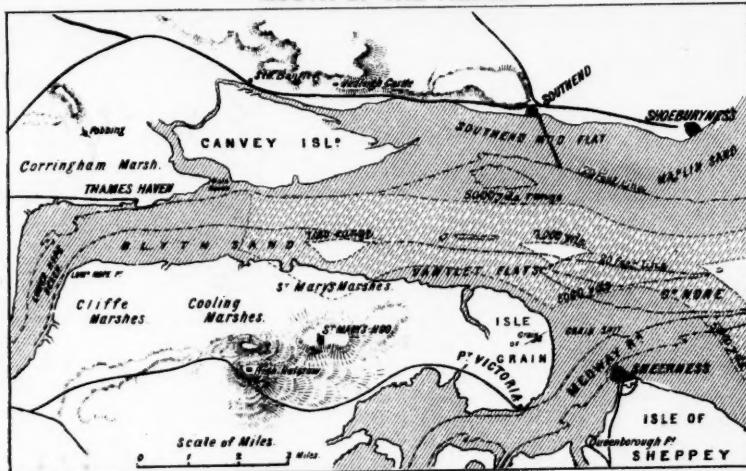
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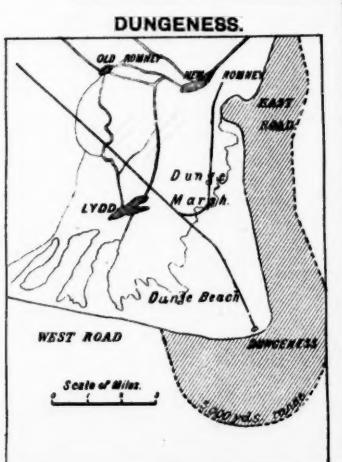


Plate 4.

MOUTH OF THE THAMES.



DUNGENESS.



HASTINGS & ST. LEONARDS.

Scale of Yards

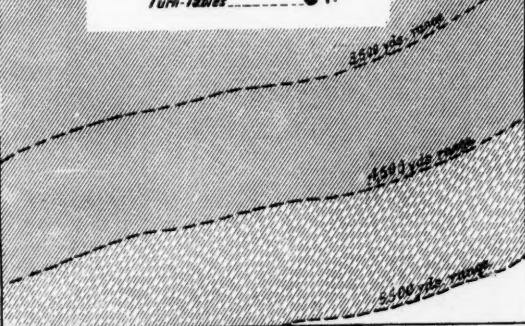
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REFERENCE

Heights 100

Position-finders ● F.

Turn-tables ● T.



AIRWAYS
D.

ROMER
HIGH
TOMMOUTH
WENSTOFF
WELLS
WELKSTONE
WHRICH
LONDON-ON-SEA
MOTER
HS
MARDATE
SEAGATE
DEAL
OVER
WELKSTONE
NNESS
ITH. ST. MARTIN'S LANE, W.C.



Then comes a short length of coast which would be undefended except by a few ancient martellos. Following these are the intricate windings of the Ore, which make the coast practically inaccessible. Aldborough, Lowestoft, and Yarmouth are well defended. After them comes a length of 12 miles totally undefended, 120 miles from London, however; then Cromer and its vicinity, which are covered. And now the vagaries of the 5-fathom line, in the Wash, will permit us to leave it aside and cross to Thedlesthorne, a possible landing, which can, however, be secured. Again the 5-fathom line runs out to sea, and the Humber is reached and closed. In the neighbourhood of Withernsea a possible landing exists, which is unsecured; this might, however, be remedied at small cost by a short extension of the line. From Bridlington north to the Border, 150 miles, the whole coast line is admirably defended on paper, and the towns of Bridlington, Scarborough, Whitby, Saltburn, Middlesbrough, Seaham, Hartlepool, Sunderland, Shields, Tynemouth, and Berwick could be protected.

A considerable portion of this coast is, however, inaccessible, and would in practice be neglected.

Crossing to the western coast, the accessible shores from the Solway to the Menai Strait are completely defended, including the ports of Barrow, Fleetwood, and Holyhead.

The western coast of Wales is not completely defended, but is in itself a sufficient obstacle.

In the Bristol Channel, Milford Haven, Llanelli, Swansea, Barry Docks, Cardiff, Avonmouth, and Bristol are covered.

The northern coast of Cornwall is in most places inaccessible; on its southern coast Penzance, Falmouth, and Fowey could be protected. Plymouth and Portsmouth may be neglected; between the two, however, Kingswear, Torquay, Exmouth, and Sidmouth would be covered.

From Portsmouth to the Thames there is a coast line of 170 miles, and of this very important section 160 miles are defensible, and the unprotected towns of Worthing, Brighton, Eastbourne, Hastings, Folkestone, Margate, and Ramsgate, all at present quite open to insult, could probably defy an enemy.

Summarizing, the unsatisfactory portions of the coast railway defence would be few and far between, and could, if thought necessary, be remedied at a trifling cost.

In Table I the details of the coast line of the English counties are given. In a total length of 1,900 miles of coast, 1,270 could theoretically be defended from the railways; 425 are inaccessible, thus increasing the total defended to 1,695, or 89 per cent. of the whole.

Of the coast of the counties close to London, and to the great manufacturing centres, namely, the counties of Lancashire, Cheshire, Norfolk, Suffolk, Essex, Sussex, Kent, and Dorset, 92 per cent. is defensible.

Every English coast town of the slightest importance is defended; every estuary and harbour the same.

(a.) *The Subdivision of the Defence.*—From the configuration of the

coast, the line to be taken in the subdivision of the defence is an obvious one.

- 1st. A South-eastern section.
- 2nd. A special defence for the Thames.
- 3rd. The Eastern counties.
- 4th. The Lincolnshire coast.
- 5th. The coast of Yorkshire.
- 6th. The defences of the Middlesborough-Newcastle district.
- 7th. A North-western section.
- 8th. A Bristol Channel section.

9th. The Portsmouth and Southern district, the major part of which is already defended.

In addition, a few minor sections might have to be introduced.

Each of these sections would, as I propose, be organized into series of—

1st. Firing lines, consisting of guns stationed at vulnerable points along the coast, or concentrated at junctions from which they could readily move up to threatened points.

2nd. Supports placed at some central point of the sections, from which the firing lines would receive their first reinforcements.

3rd. Behind these reinforcements at central points in the country would be stationed grand reserves.

Thus, if an attack be imagined at any point on the coast line of a particular section, the firing line of the section would immediately come into action if on the spot, or move up to the threatened point. Within a few minutes the support could by telegraph be started on its way to replace the firing line, and the reserve be on its way to perform this same relief for the support.

To ensure a good working system, the different sections would have to be served as far as possible by distinct lines of railway. In this country this could be effected without disturbing the divisions which the configuration of the coast line dictate.

Thus, in the south-eastern section, the South Eastern Railway and London, Brighton, and South Coast Railway would cover the whole ground, and the London, Chatham, and Dover Railway (except for Sheerness) would be an alternative route. Ashford and Lewes would be the natural positions for the central points of the firing line, New Cross the best position for the support.

For the special defence of the Thames, the South Eastern Railway on the south, and the London, Tilbury, and Southend Railway on the north.

In the eastern section the Great Eastern Railway would practically cover the whole of the ground.

In Lincolnshire, the Great Northern would do the same.

In the North-east, the North Eastern Railway, with Pickering, Norton Junction, and Gateshead as central points for the firing line, Leeds as support.

In the North-west, the London and North Western, with Preston as centre, Leeds again as support.

In the Bristol Channel, on both north and south, the Great Western

Railway could be made the section line, Bridgend as a firing line on the north, Swindon as support.

In the South-west, the Great Western Railway again, with Plymouth as firing line centre.

In the South, the London and South Western Railway, with Yeovil as firing line centre. In both this section and the south-western one Swindon would again be the position for the support.

Behind all these firing lines and supports would be kept a general reserve for the whole English system, which might be advantageously stationed at Rugby.

(b.) *Proposed Personnel and Co-operation with Railway Officials.*—To ensure the perfect success of any movable defence by sea, the directions for all general movements should emanate from one central authority.

The same would apply to any movable land defence. Generally speaking, it would seem necessary to provide a personnel somewhat on the following lines:—

(1.) One responsible head, who would be in command of all the coast defences of the country, and be in close communication with the naval and railway authorities.

(2.) Artillery Officers in charge of the subsections of the defence and of the reserves.

(3.) A nucleus battery of artillery in each section to perfect the system in time of peace.

(4.) Militia and Volunteer artillery to work the sections.

(c.) *Types of Proposed Ordnance (Heavy, Medium, Light).*—As pointed out previously, any gun can be fired from a railway in the direction of the line; relative efficiency would determine the nature of heavy gun to use upon railways. For the purposes of this paper, the 22-ton gun has been assumed to be the heaviest ordnance which would be so employed. The use of these heavy guns would seem necessary if the fire of the defence is to reach like natures of guns mounted in ships.

Too much stress can hardly be laid upon the desirability of using a great number of modern howitzers and mortars to fire out of cuttings, from behind hills, &c.

In medium ordnance the 6-inch B.L. gun and the various natures of Q.F. guns would seem to be the best.

For points where landings are possible, the lighter natures of Q.F.'s, machine, and field guns could be employed.

(d.) *Proposed Carriages.*—The design of carriages to fire guns from in the direction of the line is already well established, by their use in European arsenals. Carriages for firing at angles to the line would be a matter for experiment.

(e.) *Emplacements for Heavy Guns and Positions for Lighter Natures.*—In places where heavy guns would have to exercise an all-round fire, special emplacements would have to be provided. These emplacements might take the form of turntables located upon short sidings specially constructed for the purpose. The turntables would be of considerable diameter, their bridges of wrought iron, with hydraulic

or other suitable buffers to take up the recoil, the whole swinging in concrete lined pits.

The lighter guns could be fired directly from the main line from existing sidings, or from specially constructed lines.

(f.) *Method of Controlling and Directing Fire*:—Taking into full consideration the great advances which have been made in the last few years in the art of controlling and directing the fire from guns, even when mounted in concealed positions, there would seem to be no practical difficulty in adapting one of the systems to the requirements of the proposed system of railway coast defence.

(g.) *Estimate of Cost*.—Any estimate of the cost of the railway system of coast defence is naturally extremely difficult to reach and yet retain a semblance of probability; undoubtedly a practical survey of the ground would materially alter dispositions made upon theory.

On the extreme basis that all of the water covered from the existing railways might have to be defended, the theoretical disposition of guns of different natures previously exemplified was effected, and their cost, with that of all other requisite matériel for the defence of England, would roughly be—

	£
31 22-ton guns, with all spare parts and 3,100 rounds..	221,960
106 medium guns, &c. " " 10,600 " ..	241,680
151 Q.F. guns " " 15,100 " ..	141,940
155 carriages for the above (guns mounted in pairs)	268,000
Machine-guns	100,000
Carriages for same	50,000
Emplacements and sidings	150,000
Magazine carriages, &c.....	25,000
 In round numbers	 £1,200,000
Add 10 per cent.	120,000
 Total for matériel	 £1,320,000

This estimate as stated is not practical, but it affords to the mind a basis for comparison thoroughly with the probable cost of extending any actual system to perform the same work.

Advantages of the Proposed System.

The advantages of using for the defence of this country a system based upon the use of guns firing from existing lines of railway are numerous and apparent.

1st. The amount of resistance which could be offered at any point of our seaboard in a given time would be infinitely greater than by the use of any other practical system.

2nd. The resistance would also be the most economical that could be provided for a general defence of the country.

3rd. Once in working order, the cost of the system would depend upon the moral and physical life of its guns and their mountings.

All fixed defences and ships are dependent upon the march of the science of gunnery, as well as upon the life of the guns they contain, therefore a standard of excellence is never reached.

In maintenance expenses, the proposed system would cost less than fixed fortifications, and infinitely less than that of keeping ships in commission.

The cost of personnel would bear the same ratio to other systems as that of maintenance.

4th. The system could promise the rescue of all unprotected towns from bombardment.

5th. At the few landings which exist, a heavy force of artillery to oppose any enemy could be concentrated in a short space of time.

6th. Tide, storm, and darkness would have no effect upon the efficiency of a concentration. Fog would delay, not deter.

7th. The supply of coal for motive power and of munitions for the guns would be practically unlimited.

8th. In accuracy of fire the guns should compare favourably with like ordnance mounted in fixed defences.

9th. In mobility all existing systems would be distanced.

10th. The guns could in most places be concealed by natural features. Naval artillerymen tell us that good practice from ships against forts depends upon one important point, viz., that a distinct object must be fired at. A fort is not deemed a distinct object, a particular gun must be selected as a mark.

The result of naval fire against the guns of Alexandria did not, however, tend to show that firing at distinct objects was ever likely to be extremely damaging to that object. If the ships' guns were obliged to fire at a puff of smoke issuing from behind a hedge, or from out of a cutting, it is safe to assume that the effect of the fire would be still less damaging, though it might possibly have the effect of forcing the railway gun to shift its position from time to time. Smokeless powder would introduce the sole remaining factor requisite for total invisibility.

Finally, the system could be practically tested in time of peace in conjunction with our fleet manœuvres. Certain sections might be fully mobilized against the attacks of a squadron or cruisers which were to attempt secret aggression of some form along its shores, and umpires decide upon the efficiency of the system. In fact this might be done without actually providing the guns. Railway trucks could represent the armament, and thus the system be tried before any great expense for guns, &c., was gone into.

Examples of Ground adaptable to the Railway System of Defence.

A few examples in detail of well-known sections in their adaptability to the purposes of the railway system will I think emphasize the enormous command which our railways give us over the waters which are immediately contiguous to our shores.

As examples I have chosen an estuary, a landing, and an unprotected coast town.

To follow the phases of possible attacks against these chosen places would be mere theory, and I shall therefore limit myself to describing them in as short a manner as possible, and allow the accompanying maps to speak for themselves as to the chances an enemy would have in engaging the guns the railways could provide.

Estuary—The Thames.

As an example of an estuary, I have chosen the mouth of the Thames. In spare moments I have been able to make a close study in the field of the railways, and the ground from Sheerness to Gravesend on the south, and from Southend to Thames Haven on the north.

The accompanying map represents the result of this study. The portion coloured blue indicates the water covered up to 4,500 yards, that coloured red the same up to 5,500.

The dotted line indicates the limits of the 20-foot channel at low tide.

At Sheerness a line of railway runs in from the south, and close to the town divides into two branches, one running into the town itself, the other to Queenborough Pier.

The line into Sheerness would not be of much practical use unless a short extension of it was made towards the east, in which case a strong reinforcement to the guns of Sheerness might be brought up. The Queenborough line would afford a position for firing down the River Medway, thereby flanking the dockyard and the forts.

On the opposite bank of the river, at Port Victoria, a good position well concealed behind the sea wall could be taken up. From this portion of the line, guns could fire directly down the channel of the Medway towards the Nore light.

Moving in a westerly direction good positions exist for taking an enemy in reverse, should he force the defences of Sheerness.

After this point, which is about two miles from Port Victoria, the line runs behind and up a low range of hills to emerge and sight the Thames close to High Halstow.

At this point a good position exists. The railway concealed by small trees and hedges is at an elevation of 100 feet above the Thames, on which 5,000 yards away every boat could be plainly seen. Behind High Halstow a high-angle fire battery might be stationed, controlled by a range-finder station in the church tower (210 feet above the river).

Between Halstow and Gravesend several very good sites for batteries could be found, the fire of which might assist in the defence of mine-fields in the river.

On the north side the railway (London, Tilbury, and Southend Railway) is mostly situated in low-lying land, and is for many miles within a few hundred yards of the river bank.

Excepting for the short stretch from Southend to Shoeburyness, ideal positions for range or position finders are to be found on the hills directly behind the line.

From the railway itself every funnel and mast in the channel can be distinctly seen, and direction thus obtained without difficulty. The guns could not be seen from the decks of vessels, and even if looked for from the mast-head would be exceedingly hard to distinguish, as hedges exist on both sides of the line.

At Thames Haven a branch line would afford an opportunity for establishing guns to fire directly down the channel.

The piece of country which I have just described has unfortunately been the only one which time would permit of my studying in detail on the ground. I can only hope that other important points will after a practical study lend themselves as readily to the purposes of the railway idea.

The ranges would not be excessive, many opportunities for crossfire exist, no costly extensions of the existing lines would be necessary, and the control of the fire should be thorough and effective.

Unprotected Coast Town.

Let us now consider the case of an unprotected coast town. A well-known Admiral of a foreign Power made the statement not long since, that in the event of war with this country, he would have no hesitation in bombarding our defenceless coast towns; what would be the probable influence of the railway-gun upon his idea?

If he approached by day, our lookouts should give the necessary time for bringing up a heavy force of guns. If, however, he eluded the lookouts and took the town unawares, his punishment of it could not be of any duration; it would not, for the satisfaction of bombarding a defenceless town, pay him to risk the loss of a ship nor waste ammunition, the use of which might at any moment become of vital necessity to him. His best chance of success would, therefore, lie in an approach by night, when he might hope to pass the lookouts, and open fire on the town (if he happened to have struck it off in the night) immediately after daybreak.

As an example of a place which might be so visited, let us consider the case of Hastings and St. Leonards, which form a single town open to the sea for a length of $2\frac{1}{2}$ miles.

Double lines of railway approach the town from three directions:—

(a.) From the north-east the South Eastern, entering the town at the east end.

(b.) From the north-west the South Eastern line from Tunbridge, entering the town near the west end in combination with

(c.) The London, Brighton, and South Coast line from Lewes.

From the map it will be observed that all these lines run within a short distance of the shore, and that the hills, &c., favour concealment. Several good positions for guns are to be found on the railways. Thus at the east end of the town we find, close by Hastings station, three existing sidings well located for fire along the line; on one of these a turntable might without difficulty be laid down for a 22-ton gun; in addition to these three sidings there is a set of four more which could be utilized for any nature of fire.

At Hastings Castle a good observing station for a position finder might be established.

From Hastings Station to the Warrior Square Station the line is in a tunnel, which might serve as a shelter if the fire of an enemy became too heavy. At Warrior Square there is an open length of about 200 yards; here a battery of howitzers and mortars might be stationed, and their fire observed and directed from a church close by. After passing through a second tunnel, Bo-peep Junction is reached; here the South Eastern Railway and the London, Brighton, and South Coast lines separate, the former running into a deep cutting and bearing away towards the north-west. Excellent positions could be taken up close by this junction for flanking the front of the town or for direct fire out to sea.

The high ground close by would afford sites for range or position finders.

For the above notes of the lines about these towns I am indebted to a brother Officer, who has a knowledge of the vicinity and kindly volunteered to give me a few hints.

Landings.

As I have not actually been on the ground at Dungeness, I shall content myself with drawing your attention to the accompanying map of that section of the country which seems to demonstrate the possibility of bringing a heavy fire of all natures of guns on the water which an enemy's boats would occupy in any attempted landing. I have lately had the opportunity of visiting another of the dangerous landings of the country, that of Clacton. Here, close beside the row of ancient martello towers built for the purpose of denying the landing, a line of railway could be built at a very small cost. The guns mounted upon it would be hidden behind the sea wall and could cover the water which an enemy would occupy, both in landing and in covering his landing.

In conclusion, I may be allowed to recapitulate the leading points of my argument.

The strong point of our defensive position in England is, as I submit, our enormous railway power. Whether we regard it from the point of railway mileage open, as compared with square mileage of area to be defended in Great Britain and Ireland generally, or whether we look to the length of our extended coast line as compared with the railway mileage at or near that coast line, and therefore locally available for its defence, the conclusion is one and the same, namely, that our defensive railway power is far greater than that of any other country.

What the nature of our defensive position should be is not within the province of this paper, and I trust that I have not made statements which are construable into opinions on this vexed subject. What I have wished to point out is that the railway system of coast defence is equally applicable to all shades of opinion.

The weak point of England's defensive position is, as I have submitted to your judgment, our existing deficiency in gun power. Our coast defence is admitted to be very partial and incomplete. It leaves great lengths of our seaboard and important commercial centres on the coast, nearly if not quite undefended. And when we look inland, we find a similar deficiency of gun power for that field force which successive generations of responsible Ministers have thought to be a necessary provision for our defence in the event of invasion.

My argument therefore is, and has been throughout this paper, Why not use our strength to correct our weakness? Why should we not

TABLE.—*Details of English Coast Line by Counties.*

Coast county.	Length of coast.	Coast defended from railways.	Inacces- sible.	Total defended.	Remarks.
Kent	miles 97	miles 90	miles 5	miles 95	From Canvey Island.
Sussex	84	71	3	74	
Hampshire	100	99	1	100	
Dorset	67	40	25	65	
Devon [South ..	69	32	24	56	
[North ..	53	13	36	49	
Cornwall	171	65	96	161	
Somerset	58	42	—	42	
Gloucester	5	5	—	5	
Glamorgan	104	70	10	80	
Carmarthen	28	20	6	26	
Pembroke	94	16	67	83	
Cardigan	44	15	4	19	
Merioneth	28	28	—	28	
Carnarvon	95	55	40	95	
Anglesea	78	56	17	73	
Denbigh	9	9	—	9	
Flint	26	26	—	26	
Cheeshire	18	18	—	18	
Lancashire	102	93	9	102	To mouth of Mersey. Morecambe Bay and River Ribble as- sumed inaccessible.
Isle of Man	69	51	?	51	
Cumberland	62	60	2	62	To Bowness.
Northumberland	64	50	14	64	
Yorkshire	116	84	15	99	To Grimsby.
Lincoln	68	30	30	60	The Wash assumed to be inaccessible.
Norfolk	80	54	10	64	
Suffolk	53	40	7	47	
Essex	54	38	4	42	To Canvey Island.
Totals	1,896	1,270	425	1,695	

turn to account the enormous advantage which our great railway power gives us to concentrate every available gun at a threatened point in the right and the shortest time, which the proper utilization of our railways can and will do; thereby, as I submit, practically doubling or quadrupling our available gun power?

The CHAIRMAN: We have been listening to a very instructive lecture upon a subject which must be new to many of us, and I am sure there are many who will be able to help us by offering some remarks in the discussion which is invited.

Colonel E. R. WETHERED: I rise not with a view of criticizing any part of the lecture, and I must congratulate the lecturer on the intelligence he has exercised, and the large amount of labour and time he must have expended in working out in detail theoretically his plan of operations. To take it shortly and briefly, it is sufficient to look at the map, and let us admit for example that it is possible to fire guns of heavy calibre from our railway metals as proposed, subject, of course, to certain modifications which could doubtless be easily carried out. If you look at the coast line of England and consider our present system of defence, the distances our ships would have to travel round that coast, you will see what a number of vessels we should require to be constantly on the move and how our existing Fleet, which would be required in all its strength to strike a blow, and protect our commerce, would be supplied. Now, looking at the map, suppose we had a large reserve of heavy guns mounted and equipped at Rugby, or some more suitable central position, how easy it would be to move direct to any given point of the outer circle, which our railway system provided for. You could move your guns in one quarter, or even one-tenth, of the time that it would take to get a ship round from point to point of our extended seaboard. I have listened to the lecture with considerable interest, I may say, almost with a kind of parental feeling, not because as an old man I rise to compliment the young lecturer, but he has taken up my child, and naturally the parent always likes the man that fondles his offspring. I am getting on in years myself, and I am therefore glad to see that a very young man has risen up and taken an interest in this subject. Twenty years ago I suggested the very same thing. I wrote to the War Office proposing it. I will read you a portion of my letter. My infant met with the usual War Office attention, and I suppose it was put asleep in the pigeon-hole, and if this young man had not raised the question it might have lain there long after I had been laid in the grave. "January 4, 1871. Sir, as the defences of our country are now occupying much national concern, I hope I may not be considered presumptuous in briefly and very superficially offering a suggestion relative to this important subject. In view that all our heavy ordnance is at present mounted in fixed positions and incapable of concentration at any threatened point of our coast, or even at any particular face of a fortification without considerable labour, I would propose to utilize generally our railway system for defensive purposes, and would mount all our guns on wheel carriages, so that they could be moved along any of our lines from point to point: the advantages of such a system must be obvious, as not only would it enable us to concentrate our artillery with overwhelming force at any given point, but guns on such movable carriages could be fought with infinitely less exposure to the men." This was the reply I received from the War Office:—"War Office, 13th January, 1871. Sir, I am directed by the Secretary of State for War to acknowledge the receipt of your communication, dated 4th instant, containing suggestions for the adaptation of the railway system for defensive purposes by mounting guns on carriages which could run on the lines; and for the defence of the metropolis on a similar plan." I am not aware that any gun was ever previously mounted for firing purposes upon a railway wheel-carriage platform before this, but not being either a gunner or a sapper, or in any way mixed up with gunnery experiments, I am unable to speak from personal knowledge. Shortly after this, at the proof butts at Woolwich, an 81-ton gun was thus mounted and fired on the very principle I proposed. In 1877 I wrote to the "Times" as follows: it was printed in the "Times" of the 25th May, 1877, headed—

"PORTABLE BATTERIES.

"To the Editor of the 'Times.'

"SIR.—Any suggestion which has for its object the rendering of our seagirt island so impregnable in itself against the possibility of invasion or injury from hostile forces that our powerful Navy may be left free and unfettered by home fears or necessities to protect our extended Colonies and commerce, or to strike a blow with all its power at any given point, cannot fail to be of interest at the present time, and will, I trust, plead a sufficient excuse for soliciting space in your columns to draw attention to my proposal.

"Our present conscious security is based mainly on the command we possess on the high seas, and should any combination of circumstances render our fleets powerless to cope with the enemies' navies, the invasion of this country would admittedly be feasible. In such adverse circumstances we should depend for the defence of our coast on the existing fortifications, supplemented by such earthworks as time permitted, together with the aid of all the gunboats and torpedo craft we could command; our telegraph system would enable us to direct our floating batteries and all available troops to proceed by most expeditious means to the points threatened. The objections that occur to me in trusting exclusively to this means of defence are—

"1. All our scattered or detached forts, with their fixed complement of guns, men, and material, weaken our powers of concentration, for these forts cannot be denuded of troops, as not only must the material and stores be protected, but the transfer of gunners to any other point would be of very little service without their guns. Again, an enemy once effecting a landing and getting possession of one or more of these fortifications would secure a solid armed basis of communication, which, supported by their navy, would render their position impregnable.

"2. Our gunboats and torpedo craft, besides being largely dependent on the weather, and having very long distances to travel round the outer circle of the coasts, would not be enabled to concentrate at any given point in sufficient time; in fact, the enemy, having command of the Channel for the time being, could bar the approach of any vessels of this kind on both flanks of their disembarking troops.

"The collecting of a large force of Militia and Volunteers at any particular spot would occupy considerable time.

"Again, the enemy would, in all probability, make a feint to attack on two or more points, and having thus drawn our forces in those directions would, under cover of night, run with the main body of his troops for another part of our shores.

"Our island home, being providentially surrounded by water, possesses the strongest natural barrier against invasion that can possibly exist, and it appears to me that if we provide the means of concentrating with unerring certainty a crushing force of artillery, with guns of heavier calibre than even the war-ships of the invader could command, on any given points of the coast, before the enemy could possibly set foot on the shore, it would be impossible for the vessels of an invading force to approach near enough either to disembark or cover the landing of their men.

"My proposal is simply to take the full advantage which our railway system, in connection with our insular position, affords, and provide powerful movable batteries, which can be sent fully equipped in fighting order direct by railway to any required point, and the recent experimental trials of the 81-ton gun have proved that the heaviest ordnance can be moved and fought on railway metals with considerable advantage, the incline of the rail at the firing point forming almost an automatic platform, the recoil taking the gun up the incline, where it is held in position by the brakes, and when liberated returns to the firing point by its own momentum.

"In connection with our present main lines of railway, which probably would require strengthening at certain points, I would construct branch lines or sidings leading to every strategical point of our coast and into every fort, as far as possible;

with requisite platforms, either on the incline principle, turntable, or other mechanical arrangement. These branch lines during peace would, doubtless, be of some small commercial value. I would mount as many of our heaviest guns as practicable on railway gun-carriages, so that they could be moved by rail from one place of a fort to another, and from one place to another. The locomotives required for this service could be so mechanically constructed as to facilitate the loading of the guns by steam power, and thus save manual work. I would suggest three large central depots, where a number of guns thus mounted, fully equipped, and ready for use, should be kept. These central depots might be so constructed as to form an inner circle of fortifications to defend the metropolis. At each of these stations the regular Militia and Volunteer Artillery might be instructed in everything that pertains to the working of these guns—the construction, repair, and destruction of railway lines, besides the formation of a locomotive corps specially trained to conduct the traffic.

"Besides the drill and instruction imparted at these stations, a number of these heavy guns, fully equipped, with proper complement of men, ammunition, and material, might be occasionally moved to different points of the coast for drill and gun practice. Practical instruction of this kind would be highly calculated to interest our Volunteer soldiers, who should be given every encouragement and opportunity to render themselves efficient artillerists. The cost of such a system would not be great, for when once we have established a means whereby our heavy guns, as well as men, can be moved expeditiously from place to place, we can afford to diminish the number of our scattered forces and present immovable batteries.

"I have merely stated my views superficially; the details are easily worked out.

"I remain, Sir, yours faithfully,

"E. R. WETHERED.

"Woolwich, May 24th, 1877."

Immediately after this letter appeared, I had a number of copies printed for circulation, to which I appended the following footnote:—

"If, in addition to connecting some of our light-ships by telegraph cable with the shore, some provision were made for running out, in the event of war, from these ships a further length of cable, some 10 or 20 miles out to sea, and there establishing a temporary telegraph post, our cruizers would, by these means, be enabled to communicate any movements of the enemy or other information, without loss of time or having to quit their cruizing ground."

I am an old-fashioned man myself. I prefer one practical test to ever so many theoretical ideas, and firing at a direct angle on a railway is a point that requires very careful practical experiment, because we are taking the line at the very weakest point. The rails, the sleepers, bolts, and everything are taken at the weakest point. The wheels, metals, chairs, sleepers are constructed mainly to bear the vertical strain, and the sudden shock of discharge would throw a very considerable pressure on the outer rail. The sleepers also run across, and the bolts which hold the sleepers run with the grain in the direction of the side pressure. These are all very weak points. Therefore it would be impossible, I think, for any mathematical calculation to arrive at any conclusion as to whether the carriage and the railway metals would bear right-angle fire. Then if the gun was fired from any part of a curve, if the recoil is towards the upper side, the raised outer rail would strengthen the power of resistance, but, if the recoil was in the reverse direction, the carriage would stand partly tilted up in the direction the recoil would force it. These are matters of detail. Only admit the principle, and everything else can be worked out without much difficulty.

Colonel KENSINGTON, R.A.: I have been referred to in the lecture concerning the calculation of the overturning effect of fire at right angles to the line of rails. This problem is not easy, because it is difficult to calculate the energy of recoil exactly. It is not sufficient to take it as due only to the momentum of the projectile, because there are other causes which must not be neglected, as has been ably shown by Dr. Anderson, F.R.S., Director-General of Ordnance Factories. There is the force expended on driving the air out from the bore of the gun, which alone

is too much to be neglected. There is also the great amount of the reaction due to the expansion of the powder gas on leaving the bore, besides the actual velocity acquired by the very considerable weight of powder. By Dr. Anderson's calculations it would appear that the energy of the recoil of the 6-inch B.L. gun is probably about half again as much as the energy of recoil which would be due to the momentum of the projectile alone. This would bring the amount to 25 foot-tons at most, taking the muzzle velocity at a rather larger figure than the lecturer has given, namely, close upon 2,000 feet per second, which I believe is nearly correct. Making then these assumptions concerning the energy of recoil, and taking into consideration the average amounts for the weights of the truck and mounting that might be employed and the position of the centre of gravity, as well as the width of the track, I find that, even if the whole of the energy of recoil were available for upsetting the truck, there would be sufficient stability to prevent a complete upset. In fact, however, a large amount of energy of recoil would be absorbed by the hydraulic buffers, also by the action of the springs of the truck; so that I think that it may be fairly be assumed on mathematical calculations alone that the 6-inch gun might be fired at right angles to the truck. Further, I have considered the question in connection with experiments with the 40-pr. R.B.L. which have been alluded to, the energy of recoil in that instance not being more than 4 or 5 foot-tons, or about one-fifth of the amount for the 6-inch B.L. It appears that the gun-carriage might have in that case been able to recoil about 6 inches at most, whereas for the Vavasseur carriage used for the 6-inch B.L. there is a recoil of 3 feet allowed. This would compensate for the greater energy of the 6-inch B.L. The new Vavasseur carriage for garrison service is only constructed for a recoil of $1\frac{1}{2}$ feet, which according to my calculations would, I think, be insufficient, because the question is not merely to consider what will prevent the carriage from overturning, but rather that the front trucks should not leave the rails at all. I am satisfied that with a recoil allowed of 3 feet the truck would remain safely on the rails. I should like to say a few words on some further points connected with the lecture. I think that the system which has been brought before us is admirably adapted for the high-angle fire, which has been proved so effectual, and that the apparently long ranges the lecturer has taken, up to 7,000 yards, are not by any means excessive when considered in connection with ranges at which high-angle fire has been experimentally employed with very great success. Experiments have been made at the Isle of Wight, extending up to 10,000 yards, when a moving raft, the size of the deck of a vessel, has been successfully hit. Further, I have just been informed that at Shoeburyness the practice has been adopted of firing guns from curved rails, thus easily obtaining any required direction. It has recently been suggested that all our lighthouses ought to be connected by telegraphic communication with the land, chiefly for the purpose of giving information concerning shipwrecks that may occur near them. This would be invaluable in connection with the question of coast defence, so that the earliest information might be obtained. I think the lecture is very instructive, as showing the short period of time within which armaments of very considerable power can be brought together, and must altogether be considered a valuable contribution to the vexed question as to which of the sister Services, Army or Navy, should be responsible for coast defence.

Captain BUNBURY, R.A.: I should like to say a few words from the point of view of the man at the gun. Colonel Kensington says 7,000 yards are not extreme for high-angle fire, but I think with the medium guns, the 6-inch guns to which the lecturer alludes, that we should find considerable difficulty in hitting a ship at 7,000 yards by direct fire; in the first place, even if that range was taken from the gun itself. In many cases, as you see by the map, the town to be bombarded would be some little distance nearer to the ship than the gun would be. The ship also would be firing at a very large object; there would be no necessity for her to anchor as long as she throws her shells anywhere into the town. We should have, therefore, the difficulty of firing at a moving object. I am diffident about saying anything about position-finding in the presence of Major Watkin, who, I have no doubt, will be able to overcome any difficulties that will be raised, but, at present, it would be very difficult for us to use high-angle fire directed by position-finders, which are a necessity to accurate high-angle firing, with guns firing from trucks and moving on

railway lines. We are dependent for accuracy on direction, and without accurately laid training arcs I do not see how you are to get good results. Then, again, there is the electric communication of range and training, and I do not see how that is to be managed with guns running freely on railway lines. I think that points to the necessity of having short sidings running into emplacements for guns and howitzers. I also think the supply of ammunition in open trucks without magazines would be rather a hazardous experiment. I do not think it would tend to confidence in serving the guns. It would be difficult also to supply ammunition to individual guns if you had five or six guns in a row, unless you had a siding or branch line which would carry the ammunition round. I think the question of interruption of traffic has hardly been given sufficient attention. I fancy the War Office arrangements for moving troops and stores would be very much interrupted if a considerable portion of the line was to be taken up for the use of the guns. I fancy it would lead to friction, to say the least of it. Then, again, the ordnance would require to be practised from in peace-time, and there is local traffic to be considered. I do not know whether the railway companies would be ready to give up a portion of their lines and interrupt traffic without considerable compensation. There is one point the lecturer has not alluded to, in which I think the system would be of very great value. We depend, in time of war, very much for our coast defence upon the services of the Auxiliary Artillery, Militia and Volunteers. At present the great majority of them have little or no training with modern B.L. weapons. As to the Militia, I may say, without exaggeration, most of them have to train with the old 64-prs., though they are sent occasionally at long intervals to be trained at the forts. Under some system such as that proposed, instead of the whole regiment going to the guns, we can have the guns sent up for the use of the Militia and Volunteer regiments at their own headquarters. That, I think, would do away with great part of the difficulties we have at present in training our Auxiliary Artillery in the use of new type guns.

Lieutenant-General LAURIE: It is, I think, rather an interesting fact that the first Canadian Military College Cadet who has delivered an address in this theatre should have spoken on the subject of the protection of the shores of England. It does strike me as rather a peculiar thing that his attention should first have been directed to the defence of the mother country. As regards this subject, it strikes me that perhaps he is suggesting too much, and so may overdo his proposal. He tells us in the same address that we are short of guns. He then proposes to lock up a very large number of our guns by mounting them on these carriages. It seems to me, speaking not of course as a gunner, that it would be more desirable to fit the carriages so that the guns could be readily placed upon them whenever required, so that they could be utilized for that purpose, rather than to lock up permanently a large portion of our armament, which may or may not require to be used elsewhere. Besides, it seems to me you should not make your guns fixtures on the railway trucks, but have them detachable and available to move into commanding positions where the railway track does not and cannot run; hence it would surely be better that the trucks should be fitted to receive the guns, so that they could be utilized for this purpose, but should not be permanently connected. Again, I think, when he suggests putting these heavy guns on the railway carriages he is again going rather far. For light guns to meet raiders it seems to me to be a very serviceable and feasible plan; but to deal with heavy guns and to expect that they are to take the place of forts against ships does seem to me to go a little beyond what we are at all prepared for at present, and may destroy the chance of carrying out a very reasonable, a very fair, and admirable suggestion. I throw out these ideas, speaking more as an infantryman, a man accustomed to other work, than as a gunner; but we are much indebted to the lecturer for the care and thought he has bestowed on this novel and important subject.

The CHAIRMAN: Perhaps Major Watkin can give us some information on this subject?

Major WATKIN: I have not studied the question enough to answer any of the questions raised, because I understood the lecturer only to put the matter forward as a scheme, and not in detail. I think, when we come to matters of detail, we could possibly meet the objections raised. If you could mount the guns on the

carriage, I think then you come to the question of laying the guns, but I should be very sorry to lay it down exactly how it is to be done.

The CHAIRMAN : I think that the lecturer has done good service in bringing this question forward and suggesting that a movable armament, such as is recognized as part of the defence of a position occupied by a chain of forts, might be utilized for the defence of the country at large, for, if not applicable to the extent he suggests, it might still be adopted for special sites. His proposals are not altogether new. We have been told by Colonel Wethered that somewhat similar proposals were submitted by him to the War Office in 1871, and the Index of Lectures that have been delivered in this Institution shows that the subject was also brought forward by an Officer of the 79th Highlanders in 1865, so that we may suppose that what has occurred to several minds has doubtless a good deal in it. The lecturer's proposals would enable one gun to do the work of two or more, for, by having the guns concentrated and moved to different places on the coast where they might be wanted, they could do a great deal better service than if they were kept locked up in one or two places. Besides which, at a time of invasion or attack in this country, when every available horse would probably be taken up, we should have the advantage of rapidly getting the guns by rail somewhere near the places where they would be wanted, instead of having to rely exclusively upon horse power for the purpose. We have had an estimate put before us of 1,320,000/- for doing this; it is a pretty large sum, but I fancy it is not quite enough. It does not include a great many accessories that would be required, such as the cost of providing storehouses and of purchasing land and making sidings and gun emplacements, which would be necessary, not only to prevent the main lines being blocked by the armoured trains at a time when troops would have to be hurried up to points where the attack was likely to take place, but also for the efficient working of the guns. Considering the long range which is proposed for the guns to fire over, I understand that high-angle fire is intended, the guns to be worked by means of the position range-finder from places where they would not themselves be seen. I doubt whether Militia or Volunteer Artillery would be able to do much accurate practice at boats moving about under such conditions. There are, however, others much better fitted to give an opinion upon this point than I am. Machine and other guns for direct firing to oppose a landing could not well be used from the lines of railways; they would have to be brought nearer the points to be defended. The London, Brighton, and South Coast and other lines referred to by the lecturer are pretty close to the sea, but I think there are few places on those railways where we could actually put guns on the metals and look over the sights of those guns to fire at any places where troops might probably be landed; arrangements would therefore have to be made for getting such guns to the front, to points where they could be used. The Officers of the Engineer and Railway Volunteer Staff Corps might have a good deal to say in the matter dealt with in this lecture. They would probably have to make the traffic arrangements in great measure for the armoured trains, if any such scheme as is proposed here were to be adopted, and I am sorry none of them happen to be here to-day to help us in the discussion.

Lieutenant GIROTARD, in reply : My first thought of this idea was more in connection with siege attack than coast defence, and in its bearing on siege attack I can see no reason why the idea is not quite appreciable. I have examined the country round Paris and Belfort, and apparently the heaviest guns, if necessary, could be brought up and laid directly on the forts, quite out of range of the guns that are mounted in them. But as the question of coast defence was one which more directly affected our own country, I abandoned the question of siege attack and went into coast defence. I then became aware, by going through back papers, that Colonel Wethered and Mr. Walker, of the 79th Highlanders, had proposed the scheme many years ago. At that time, unfortunately, a great many of our present railways were not constructed, and the scheme was not so feasible as it is to-day. Captain Bunbury has spoken of a few objections to the scheme. The lecture to-day was never intended to go into detail. It seems to me that if the general idea is sound there certainly could be no difficulty in the details which might not be got over in some reasonable way. He has raised a few objections; one is the supply of ammunition. I can see no difficulty in this matter.

Special cars are provided, which would come up with the trains and be left at a short distance from the place where the guns would take up their firing positions, and also as to the supply of the ammunition from those cars to the guns. The lines are double, and the simplest method would be to use the second line to run a small car on, and thus take up the ammunition to the guns. In the matter of interruption of traffic, Captain Bunbury, by admitting the fact that an enemy was bombarding a town, certainly admits the fact that the traffic would be interrupted, and in such a case I do not think any regular railway trains could run upon them. Practice in peace-time, which Captain Bunbury spoke about, is, I think, one of the things which makes the scheme peculiarly valuable. It could be practised in peace-time and thoroughly perfected. General Laurie spoke about the locking up of the guns. I cannot quite see myself how one could dismount the guns. They need not necessarily be guns of the latest pattern. We have any number of guns in the country which are not used because guns of later pattern are superseding them. If we separate the guns from the carriages, the scheme could hardly be ready in time of war. The scheme would have to be studied very carefully in peace-time, and all the details worked out. General Laurie also spoke about replacing fortifications by the use of these heavy guns. That, I think, was the last idea I had in my mind in this paper. What I did mean was that we could not hope to extend the present fortifications, and that there were many points on the coast which were totally undefended, and here the scheme could be used to greater advantage. If we only bring up light guns we may have heavy ship's guns to deal with, and I cannot therefore see that the exclusive use of light guns would be advisable; therefore, I proposed at the more important points to put one or two turntables, in order that these heavy guns might serve three or four places. If you put a coast battery for each place it would reach the cost of fifteen or twenty of these guns, or probably the cost of the heavy guns for the whole of the country. General Dawson-Scott spoke about blocking the concentration of troops coming up in case of invasion. Undoubtedly there would be some objection to this, but, at the same time, it is laid down that it does not pay to entrain troops unless they have 20 miles to go. I think it is 30 or 35 miles in Europe, but in this country, on account of our numerous railways, we assume it to be 20 miles. At any of these points it will be noticed that the guns would be up long before the troops would begin to entrain. Ashford is only 17 miles from Lydd, and the guns would be in position before the line would be used, and therefore would not cause a block. This would also seem to be the case at Clacton, as the guns would only have to travel from Ipswich. These are the two most dangerous landings in the country. At other points, if the bombardment of a town is going on, I cannot see how the ordinary traffic could possibly go on. Therefore, I should think no interruption would take place. In conclusion, I must thank the Officers who have kindly helped me. This paper is not an undivided effort, a great many people having very kindly assisted me in every way.

The CHAIRMAN : It only remains for me to ask you to join me in thanking the lecturer for this very interesting paper, and also to thank those gentlemen who have taken part in this discussion.

Friday, May 1, 1891.

GENERAL THE RIGHT HON. LORD CHELMSFORD, G.C.B., Vice-President, in the Chair.

THE LATE ROYAL MILITARY EXHIBITION, AND ITS VALUE FROM A MILITARY POINT OF VIEW.

By Major G. E. W. MALET, late Royal Artillery, Hon. Director Royal Military Exhibition.

WHEN, in June, 1888, I first brought before the Council of the Army Guild the idea of an Exhibition on a large scale in London, to which soldiers should be invited to send the products of their handiwork in leisure hours, some of my friends thought that Tommy Atkins had no time for anything beyond his military duty; secondly, that if he had, there must be something wrong in his regimental administration; and, thirdly, that very few would be able to send anything worth looking at. It may not, therefore, be an easy task to convince everybody that the Royal Military Exhibition possessed any value from a military point of view, in support of which theory I have been honoured by the Council of the Royal United Service Institution in being invited to read a paper. If the soldier be regarded merely as a fighting machine, I should not be claiming your indulgence as listeners to-day; but, since my experience, after twenty-one years' service, is that a soldier is a better fighting machine in every way, from a due recognition of the social side of his character, I trust that this *résumé* of the organization, development, and work of the Royal Military Exhibition will show that it may claim to have done something, side by side with improved armaments, drill, and equipment, for the good of the Army, and therefore to have been of some benefit to the nation.

From experience gained in the series of exhibitions at South Kensington, it was evident that an industrial exhibition of soldiers' work alone would not pay. The prospectus, therefore, included a loan collection of military uniforms, arms, pictures, and relics, in which section I received great assistance from the United Service Institution, and a Trade Section for articles of manufacture of use to soldiers. As a further inducement to the public to patronize the Exhibition, a large piece of ground was reserved for military drills and sports by day and fireworks by night, which attractions, in addition to constant performances by military bands, and tastefully laid out gardens, brilliantly illuminated by electricity after dusk, would, it was anti-

cipated, be considered a good return for threepence paid for admission by soldiers in uniform, and one shilling paid by the general public. It is satisfactory to know now that that hope was amply fulfilled.

The organization of the Royal Military Exhibition was planned strictly on military lines, the first step being to obtain the sanction of H.R.H. the Commander-in-Chief and his approval of the names of Officers on the Central Committee under the presidency of General Lord Chelmsford, G.C.B., then the co-operation of General Officers Commanding Districts, and, lastly, that of regimental and departmental Commanding Officers of the Regular and Auxiliary Forces. How willingly their co-operation was accorded may be gathered from the fact that within a very few weeks after posting the circular letters I was placed in communication with local committees in no less than 107 military centres in the United Kingdom.

The duties of these local committees were to make the Exhibition known within the limits of the command, and to collect exhibits. These committees further had the power to reject any articles which in their opinion were not worthy of being sent to London, for which purpose they were recommended to hold local exhibitions where practicable.

The following example will illustrate the method of procedure. The Committee at X. received applications for space from Serjeant A., —th Hussars, Gunner B., R.A., Sapper C., R.E., and Private D., 1st Battalion — Regiment, all quartered at X. The applications having been examined, and the exhibits inspected and approved, an application on the official form was in the case of the infantry soldier sent to the Secretary at his Regimental District, and in the case of cavalry, artillery, and engineers, to the Centralizing Secretaries at Windsor, Woolwich, or Chatham. *These Officers sent to me, by a named date, a requisition for the total space required, and thus enabled me to plan out the allotments, no easy task considering that the amount applied for was 7,000 square feet in excess of what it was possible to give, irrespective of a large number of applications which arrived subsequent to the date named as the last day for receiving them.*

But it is not my intention to give a description of the Exhibition, for, in the first place, no doubt, all here present saw it; secondly, a description would occupy a longer time than is at my disposal; lastly, the description would hardly come under the subject of my paper.

I will do my best briefly to point out its value—

1. As an incentive to habits of industry.
2. As a stimulant to recruiting.
3. In the employment of old soldiers.
4. In having given practical proof of the great improvement of late years in military music.
5. In having collected under one roof, in the Trade Section, so many objects of practical use to soldiers.
6. In having produced a financial surplus, to be employed for the benefit of soldiers.

1. As an Incentive to Habits of Industry.—In proof of the popularity of the Exhibition amongst soldiers, I may mention that no less than fifty-four out of the sixty-nine territorial regiments applied for space in the Industrial Section; and that allotted to Cavalry, Engineers, Army Service Corps, and every department of the Army was eagerly sought for. Visitors who had always been under the impression that industrial work by soldiers comprised little more than patchwork quilts of marvellous hues arranged in the most inartistic confusion, and mats made out of old regimental facings, were amazed to find what a vast variety of exhibits was to be found in the Industrial Section. Amongst the articles catalogued were carvings in wood, collections of flowers and insects, articles of equipment, fire escapes, furniture, leatherwork, machinery (steam and electric), mechanics, metalwork, models, mosaics, needlework, patchwork, paintings, penmanship, photographs, plans, pottery, range-finders, rifles, signalling apparatus, sketches, stuffed animals and birds, targets, and many other exhibits, showing an order of excellence that evidenced the good use made by Tommy Atkins of his leisure hours. No one expressed her pleasure and surprise at these exhibits more frequently than Her Majesty the Queen during her visit. I claim then, that one proof of the value of the Exhibition from a military point of view lies in its having shown that soldiers will, if encouraged, acquire habits of industry which will be of incalculable service to them on their return to civil life.

The employment of soldiers after leaving the Army is a question intimately connected with that of recruiting, and the recruiting question is a serious one at the present day. I am confident that the large number of unemployed time-expired soldiers, the majority of whom have never learned a trade, or, if they did before enlistment, have forgotten it, acts as a powerful deterrent to recruiting, and takes a considerable amount of gilt off the recruiting sergeant's gingerbread. It is hard enough for the old soldier, even if he be a skilled artizan, to obtain employment in civil life, and even when he finds it, to be so heavily handicapped as he is by competition with men of his own age and qualifications, who didn't "go for a soldier;" how much harder then is it for the thousands whose sole idea of earning a livelihood is a situation as a messenger or porter (the lighter the better) or lodgekeeper! Ask the secretary at 12, Buckingham Street, how many such obtain situations! I trust that the day is not far distant when the Army shall be the stepping stone to all appointments in the War Office and Post Office, if not in other departments under Government; and that, in the meantime, soldiers will be offered every inducement to occupy their leisure hours in some one of the many branches of industry, the proceeds of which formed so attractive a feature in the Royal Military Exhibition.

2. As an Incentive to Recruiting.—The value of the Exhibition from a military point of view was exemplified in the "Battle Gallery." In this gallery were arranged paintings and relics illustrative of the history of the British Army from the Revolution in Ireland of 1688 till the present time, a period of 200 years, from the siege of London-

derry to the last of the many Black Mountain expeditions. These exhibits were placed in chronological order, the colours and arms on the walls being directly connected with the events commemorated in the pictures near them, with the portraits of the distinguished Officers who were engaged in the several campaigns, and with the relics placed in the cases on the floor.

Love of daring and *esprit de corps* are not yet extinguished in the hearts of Englishmen; and, of the million of visitors who gazed upon those records of brave men and acts of heroism, who can say how many young men may have been fired with the very natural ambition to emulate the gallant deeds of Englishmen in all quarters of the earth?

As an incentive to recruiting, too, I may mention the drills, military sports, and athletic contests which took place daily in the arena—an open space about 320 feet by 250 feet, in the Royal Hospital Park—and attracted large crowds of sightseers. I received the most cordial assistance from regiments, both of Regulars and Volunteers, in providing fixtures for this section of the Exhibition. Amongst the entertainments, all of which were calculated not only to interest the public, but also to show the perfection of military training, were musical rides, driving drill, various mounted sports, artillery and infantry drill, sham fights, gymnastics, encampments, field railways, ambulance, field hospitals, Highland dances, assaults at arms, foot races, football, &c. Military cycling also was a strong feature in the arena, and these displays tended to show in a marked degree the development of this latest aid to the mobility of an army.

In the series of competitions held during the Exhibition, prizes to the value of over 700*l.* were distributed; many of them of considerable value.

The large building in the arena which was devoted to ambulance matériel excited much attention, and even if intending recruits may have hesitated to enlist, on witnessing the realistic horrors of a battle-field so faithfully depicted, from which wounded men were being taken to the base hospital, such feelings must have been overbalanced by the sight of the wonderful advance in all that appertains to the relief and care of the wounded. Here were to be seen ambulance carriages for military service, regulation stretchers, stretchers with telescopic handles, Ashford litters, stretchers on spring frames to mitigate the jolting in railway trucks or country carts, folding trestles for camp beds, field hospital transport by road or rail, adapted to different climates and circumstances.

Captain Tomkins' "tortoise" tented wagons were exhibited in this section, each wagon being complete with hospital equipment, and the tilt forming a tent capable of accommodating twenty men when in camp; the whole presenting such a scene of comfort and care that I was not surprised one day to hear a pensioner wearing the Crimean medal remark, "I say, Tommy, this ere's rayther different to what we had after the battle of the Alma." In connection with this section, I must not forget to mention the ambulance station, which was organized and maintained by the Ambulance Association of the

Order of St. John of Jerusalem, with the sanction of H.R.H. the Prince of Wales, Grand Prior of the Order. Under the able management of Mr. John Furley, the ambulance staff was in attendance daily, with the object of rendering first aid in case of accidents. Since no less than 244 cases occurred during the time that the Exhibition was open, the value of the services so freely given may be imagined.

3. *The Employment of Old Soldiers.*—The large staff that was necessarily employed in the Exhibition consisted of fifty-nine soldiers, who were detailed for this duty by the military authorities, and forty-six civilians. In my selection of the latter, I was careful to say, "None but old soldiers need apply," and I think that in making that rule I may claim another point in favour of my contention as to the value of the Royal Military Exhibition from a military point of view. With shaven chins and a serviceable but smart uniform, these old soldiers resumed their military habits, and with very few exceptions did excellent service. I was amused to hear that on one occasion a distinguished Officer was puzzled to know what regiment the soldiers with R.M.E. on their forage caps belonged to! They were kept under strictest discipline, and were occasionally paraded in order that they might be thoroughly acquainted with the duties for the day. Punishments were rare, as disobedience of orders was almost invariably followed by dismissal. It was a great satisfaction to me to know that so many old soldiers were, by means of the Exhibition, earning good wages, and by their uniform good behaviour and manners were a credit to the Service.

4. *The Improvement in Military Music.*—It was, perhaps, in the arrangements for the music that the value of the Royal Military Exhibition was put to the most practical test. Through the kindness of H.R.H. the Commander-in-Chief, permission was given for regimental bands to come up to London from all parts of the United Kingdom. No less than sixty bands availed themselves of this permission, and it was thus rendered possible for the public to form an opinion upon them and on the great improvement in military music which has been brought about since the establishment of the School of Music at Kneller Hall.¹ Thirty years ago, English bandmasters were the *exception*, now they are the *rule*, and, as the energetic Commandant of Kneller Hall says in his report, "It has been proved that, whereas twenty-four years ago the bands of the British Army were the 'reverse of attractive,' and admittedly about the worst in Europe, they now compare favourably with those of any Continental army; showing that the element and material were not wanting in those days, but rather competent bandmasters. It is therefore clear that the very satisfactory and high state of efficiency of our bands to-day has been caused by the superiority as musicians and instructors of the present military bandmasters, compared with the civilians of the period referred to, and now happily of the past." 50*l.* were voted by the Committee for three prizes in composition, open only to band-

¹ As an instance of the value of the school, I may mention that bands were able to perform, massed in the grand stand, without previous rehearsal together.

masters, non-commissioned officers, and men of the Regular and Auxiliary Forces, and attracted a number of competitors.

5. *The Trade Section.*—In the Trade Section, although exhibits were limited to such articles of manufacture as were directly or indirectly of use to soldiers, 1,600 square feet of space was applied for in excess of that available, and the large sum of 3,300*l.* was realized by rentals, which thus rendered it possible to give soldiers space in the Industrial Section without charge. Special inducements were offered to trade exhibitors to show the latest improvements in the following articles:—Machines for supplying hot tea, coffee, and cocoa, and mineral waters, in camp or on the march, and in garrison coffee and recreation rooms; portable tea, coffee, cocoa, and preserved milk; filters and other methods for the purification of water; nutritive and portable meat biscuits, soups, vegetables, and forage; bread making and field ovens; camp equipment and canteens; scientific instruments for field service; medical chests and appliances; all of which are of special interest to the Army.

In this section, Officers were enabled to appreciate the great improvement that has taken place in equipment for foreign or active service, especially as regards preserved rations, clothing, boots, saddlery, arms, ammunition, accoutrements, on all of which points the comfort and efficiency of soldiers in a great measure depend. For such improvement the country is mainly, if not entirely, indebted to civilian enterprise, and I am of opinion that, considering the very great changes that are constantly taking place in manufactures, it would be of material benefit to the Army if an exhibition of such articles as I have enumerated could be held periodically, say once in ten years. Such an exhibition would attract manufacturers in wholesale competition. Bands and illuminations would draw the public, and some of our many military charities would, under careful management, reap considerable benefit from the funds.

During the summer, a very searching inspection of these exhibits was made by the Awards Committee, under the able presidency of Lieutenant-Colonel W. White, R.A., on the recommendation of which Committee the several awards were made.

6. *The Financial Surplus.*—Under the foregoing headings it may be urged that I have shown the value of the Royal Military Exhibition only in a temporary way. In my 6th point I will claim that its results will be a benefit to soldiers for years to come.

In the debate on the Army Estimates this year, the Secretary of State for War said, "No greater or more important improvement has been suggested than that which in the form of regimental institutes has gradually provided the soldier with a warm and comfortable club."

It was solely and entirely with this object that the Royal Military Exhibition was conceived and carried out, with the gratifying result that a sum of nearly 10,000*l.* has been secured in aid of Church of England Soldiers' Institutes.

The first of these Institutes was formed by the Army Guild, at Aldershot, in 1880, and the soundness of the principles on which it

was conducted induced Lord Cranbrook, after consulting the General Officer Commanding that District, to assist the project with the munificent donation of 1,000*l.*, which enabled the Building there to be extended, and was the means of bringing in financial support for this and other Institutes conducted on similar lines in other large garrison towns, their popularity amongst soldiers proving that they supply a great want. These Institutes are not mission halls, but places of resort, promoted by members of the national Church, for the nation's soldiers, where Officers, non-commissioned officers, and men can meet on terms of friendly intercourse for mutual and personal edification. His Royal Highness the Duke of Cambridge remarked at the public meeting at the Mansion House, on the 20th March, 1890: "The object they had in view was to make every soldier a good citizen and a good public servant, and everything that would lead in that direction would have his support as the head of the Army. The Institutes encouraged soldiers to enjoy themselves in a respectable manner, and were, therefore, deserving of support." The Right Hon. the Lord Mayor at the same meeting said: "Their object was to amuse and improve the soldier, and if they could improve a man through his amusement and amuse him through his improvement they were doing double good." The special advantages which they offer to non-commissioned officers and men are briefly those of a *free club*, where they can obtain refreshments at a reasonable rate, write their letters, read the papers and books, occasionally enjoy concerts, lectures, and other entertainments, and thus find rest and healthy recreation in leisure hours. Major-General E. F. Chapman, C.B., in an able article published in the March number of the "United Service Magazine," says: "If any one doubts the possibility of raising the moral or intellectual tone of the British soldier, I would ask him to pay a visit to the Church of England Soldiers' Institute, at Aldershot, and then say whether he does not think that the men who during their service in the ranks have learned to appreciate the value of such a place, with its opportunities for sensible recreation, quiet reading, and last, but not least, cleanliness, are not likely to prove useful members of the working classes." I have given this remark *verbatim*, for it is, I consider, a great satisfaction to have such valuable testimony to the value of the Institute from an Officer of such well-known abilities as Major-General Chapman.

Such testimony, moreover, shows that the Institutes possess a great advantage to Officers, many of whom know little of the feelings or ideas of the men except through the medium of the non-commissioned officers, and are somewhat slow to recognize the enormous intellectual power of the working classes. Non-commissioned officers and men to-day read high class magazines and books, and are capable of forming and expressing clear opinions on things generally supposed to be beyond them. They frequently criticize field days in a way that would astonish those who look upon them as mere machines. A freer social intercommunication off parade would break down many a prejudice, would tend to strengthen, not relax,

discipline, and would raise rather than lower the Officers in the eyes of non-commissioned officers and men.

This concludes the arguments in favour of my contention as to the value of the Royal Military Exhibition from a military point of view. I have confined my remarks to such matters as seem to me to have been of direct interest to soldiers. For full details of the Exhibition, I must refer you to "The Catalogue and Guide," and to my Report, presented to the Exhibition Central Committee at the War Office on the 31st January, 1891, both published by Messrs. Clowes and Son. The former shows not only the many branches of handiwork with which soldiers can occupy their spare time, but also gives detailed description of the fine collection of historical relics and battle pictures. The latter contains appendices giving information as to financial matters, the names of donors, guarantors, and contributors to the loan collection, a list of regiments the bands of which were engaged, and many other statistics. The work connected with the management of the Exhibition was to me most interesting, and when the popularity which it met with from the public had banished all fear of a successful result, I was relieved from the only anxiety which naturally existed in its earlier stages. The result proved that, although we are said to be a nation of shopkeepers, yet a deep-rooted interest exists amongst all classes of Her Majesty's subjects in everything that concerns the military Service, in which so vast a number of those subjects spend many years of their lives.

I cannot bring my Paper to a close without making a brief reference to the Royal Naval Exhibition, to be opened to-morrow by H.R.H. the Prince of Wales. It was only natural that sailors should take the opportunity, given them by soldiers, of organizing what promises to be the great event of the London season this year. With the success of the Military Exhibition before them, and the site and buildings ready to hand, the opportunity was too manifest to be allowed to pass. We are, as we ought to be, proud of our Army; but England is a maritime nation, and we are still prouder of our Navy as the senior Service. We may well argue, therefore, that the popularity which the Royal Military Exhibition attained in 1890 will, in the case of the Royal Naval Exhibition, be intensified in 1891, and that both will long be remembered, not only as places of amusement, but also of information in all naval and military matters which have combined to place the Empire of Great Britain in the foremost place amongst the nations of the earth.

Major-General MONTGOMERY MOORE: I have waited for somebody to rise, because anything I have to say would naturally come at the end; nor should I have said anything had it not been that the lecturer referred to a hope that an exhibition of this nature might take place periodically. I might say, as a preface, I think the Army, so far as the Church of England is concerned, owe a very great debt of gratitude to Major Malet for the energetic and able manner in which he has performed the duty of Secretary of that very interesting Military Exhibition. The pains that he took, the enormous amount of labour he must have voluntarily undertaken, I suppose few people can appreciate who have not been concerned in such a business. But though I am loth to introduce

a note of what may be considered discord in matters so interesting to those concerned, I must express a regret that the Military Exhibition, embracing as it does our whole Army and every denomination in it, and every phase of opinion in it, should have sailed under two flags which could not have carried entire unanimity among those who supported and patronized it. One I refer to is the Church of England. I am, I hope, a loyal member, though a very indifferent member, of the Church of England, but I must regret that the flag of the Church of England—of our old historic Church—should have waved over an exhibition which is distinctly for the benefit of the Army at large, comprising as it does every denomination in it; and I consider that the fact of its having sailed under that flag must have kept numbers, not only from the Exhibition itself, but from the advantages that the Exhibition professed to give, viz., assistance to Church of England Institutes. There is also another flag under which it sailed: a flag which has the adherence of a vast number of people in our country, but very few of the entire number, and that is the flag of Total Abstinence. It is a flag which I cannot but consider is more or less of a fad. For myself, I have considered—although this is not the time or place to go into the subject entirely—that Soldiers' Institutes should be established on the principle of the civilians' club: and why should Tommy Atkins be brought into a place where he should be treated as a child, and told he is only to drink tea and coffee and lemonade, I have never been able to see. When I commanded the South-Eastern District, we introduced a Soldiers' Institute at Dover on three general principles: one was that it should be wholly and solely undenominational—not connected with Church, or that any religious discussion or meeting should be admitted; the second was that they should give the soldier the privileges that he has in his own canteen, of having his glass of beer or other alcoholic drinks; and the third was—that he should be a subscriber. These are, I submit, the three conditions on which Soldiers' Institutes, to be flourishing and to catch the rowdy as well as the steady soldier, should be established; and, therefore, as the lecturer has mentioned that he hopes there will be future exhibitions of the sort, I only hope and trust, in the interests of the Army, that they may be thoroughly undenominational, because, although I am perfectly aware that Institutes under the name of the Church of England are not exclusively for that denomination, yet I must ask him whether he considers that a Roman Catholic or a Nonconformist can partake of the benefits of these Institutes without losing a certain amount of self-respect. I made my remonstrance to the Committee of the Exhibition at a very early stage, because I thought it was such a valuable idea, and capable of such help to the Army at large, that I did hope and trust that they might reconsider their decision, which involved cutting off, as it were, a large number of our fellow-countrymen from sympathy with it.

The CHAIRMAN (Lord Chelmsford): I must ask you to pass a hearty vote of thanks to the lecturer for coming here to-day to give us the information he has done regarding the Royal Military Exhibition. Before asking you for that vote, I should like to make a few remarks with regard to the speech of my friend General Moore. It is perfectly true, as General Moore says, that there was a good deal of feeling with regard to the object for which the Exhibition was held, being connected with the Church of England Soldiers' Institute; but that was considered by the Commander-in-Chief—who we all know is the friend, and the hearty friend, of soldiers of all denominations—and he did not see any reason why he should not give his sanction and support to the Exhibition, as distinctly having for its object the maintenance of these Church of England Soldiers' Institutes, and their assistance by any surplus that might be gained by the Exhibition. These Church of England Soldiers' Institutes are no doubt in name sectarian, but in principle they are absolutely non-sectarian. General Moore said that Roman Catholics and Nonconformists could hardly enter those institutes without loss of self-respect, but I have been told, as an absolute fact, that at Aldershot Roman Catholics and Nonconformists go to the Institute, and make every use of it. There is no chance whatever that in entering these Church of England Soldiers' Institutes members of any other Church will in any way be annoyed by hearing any of the tenets of their own particular form of religion either animadverted upon or denounced in any way. The

religious work of the Institute is kept distinctly apart, and no one is ever asked to attend any of the religious meetings which may be held within those walls. Such attendance is purely voluntary. It may be remembered that three years ago there was a large bazaar held in London ostensibly for Soldiers' Institutes generally; but the whole of the money that was obtained by that bazaar, amounting to something like 7,000*l.*, was devoted entirely to Wesleyan Soldiers' Institutes. Surely, if the Wesleyans hold a bazaar for their particular section, it is not unreasonable that the Church of England, who were the first to start these Institutes at Aldershot and Colchester, should be allowed, without adverse comment, to raise moneys by an Exhibition for their maintenance and support; more especially when they are for the benefit of every persuasion serving in the Army. I may mention with regard to the distribution of the surplus, that I have been in communication with the Chaplain-General. It amounts to a considerable sum, 9,774*l.* 1*s.* 10*d.* A circular containing the rules and regulations which have been formed for the management of these Soldiers' Institutes will be sent to all other Institutes in different garrison towns throughout the United Kingdom. If they can manage to work on those lines there seems to me no reason why they should not receive such assistance as may be considered reasonable. Many of these Institutes do not like any interference in their management, and may possibly be disinclined to accept those conditions. However that may be, I can only say for myself, and I believe that other members of the Committee share my opinion, that I am most desirous of giving these Institutes help if it can possibly be managed. As I have already said, there are certain rules laid down for the guidance of these Church of England Soldiers' Institutes, and unless the other Institutes will consent to come under those rules, not too hardly drawn, I am afraid it will not be possible for us to give them assistance. With these few remarks, which I must apologize for having made so long—but I was anxious to remove any misapprehension that might be in the minds of those who are present with regard to the object of the Military Exhibition—I will ask you to pass a very hearty vote of thanks to Major Malet for the short but concise and interesting paper which he has just read to us.

Major MALET: My lord, ladies and gentlemen, I am rather sorry that we have not had a little more discussion. I think discussion is always healthy—a safety-valve is always useful. General Moore and myself had some correspondence at the earlier stages of the Exhibition, and I trust what Lord Chelmsford has said may carry conviction to him. There is only one point on which I wish to add anything to what Lord Chelmsford has so carefully explained, namely, that the Bazaar to which he alluded sailed under the flag of Soldiers' Institutes, and it was not until it was over that they found out that Wesleyans only need apply; other Institutes felt a little sore that they did not get a share of the profits, as it was under the general flag. As to the teetotal question, I think that is a matter of detail; I believe it has been well considered by the promoters of these Institutes. I rather think there was a considerable amount of feeling that it would not quite be the correct thing to have too much counter-attraction to the canteen. The regimental canteens were popular, and if the Institutes had a large wine, beer, and spirit business going on to draw people away from the canteen, of course the canteen would suffer proportionately. Soldiers who frequent the Institutes are perfectly content with coffee, tea, ginger beer, &c.; and if they want wine, beer, or spirits they know where to go for them. It was not because we thought it was wrong for a man to drink beer, wine, or spirits, but simply because we thought, as a matter of etiquette, it was unadvisable to run against the regimental canteen. I thank you most sincerely for the vote of thanks you have so kindly accorded me.

Wednesday, May 6, 1891.

LIEUTENANT-GENERAL A. J. LYON FREMANTLE, C.B., Deputy
Adjutant-General for Auxiliary Forces, in the Chair.

THE YEOMANRY AND ITS FUTURE.

By Colonel Hon. H. G. L. CRICHTON, Commanding Hampshire
Yeomanry.

The CHAIRMAN : I am sorry that we have not a larger audience to hear this paper read by so distinguished an Officer as Colonel Crichton. Not only is he an excellent Yeomanry Commanding Officer, but he was Adjutant of the 10th Hussars. He has also held important appointments on the Staff, and I know nobody more capable of giving us interesting remarks and information upon the subject of Yeomanry. I have myself only been connected with the Yeomanry for about five years, but I defy anybody to have had as much to do with the Yeomanry, and seen as much of them as I have, without feeling, at all events, an immense interest in the Force. Of course we all know the great difficulty they have had to contend against. We know that the money they get from the Government, although some people think it is a large sum, is insufficient for the support of the regiments, and that not only the Officers, but the Yeomen themselves, spend large sums of money, and give their time as well as their money to the country. I hope that we shall find some way of utilizing the services of the Yeomanry with advantage for the defence of the country. With these few remarks I will ask you to hear the lecture which Colonel Crichton is going to give us.

I HAVE been asked to give a lecture on "The Yeomanry and its future," and I consented to do so, because I consider that the discussion which may, and will, I hope, follow upon it is likely to do good to a force which has existed for very many years, has always done to the best of its ability whatever it has been called upon to do, is often maligned (especially in Parliament) by those who know nothing about it, and will, I consider, in the future play a very prominent part in the defence of Great Britain, in conjunction with the other Auxiliary Forces of the country, and as the only reserve to our small force of cavalry, which would so soon be swallowed up in a great European war.

I propose to divide the lecture under the following headings :—

1. Past history.
2. Present history.
 - Mode of inspection.
 - Finances.
 - Organization.
 - Equipment.
3. Its future utility.

The Yeomanry was a name given to a force of Volunteer cavalry first raised in 1761, and embodied in 1797, when numerous regiments were formed.

In 1799, the Pembrokeshire Yeomanry were called out when the French landed at Fishguard, and are allowed to bear that name as a badge of their services.

In 1804, an Act of Parliament was passed consolidating and amending previous Acts passed relating to corps of Yeomanry in Great Britain. This Act, with a few amendments, is still in force, and relates, amongst other things, to the assembly of corps on invasion, or the suppression of riot; it sets forth the advantages of belonging to a corps of Yeomanry, viz., exemption from ballot for the Militia, and being able to ride through a toll bar when in uniform without paying, as well as exemption from the tax for using hair powder. There was another advantage until lately, viz., that of keeping a horse without paying a tax; but, as there never is a ballot for the Militia, as turnpikes are gradually being done away with, and the horse tax is abolished, and we no longer require powder on the hair, the advantages have resolved themselves into honour, glory, and expense.

In 1805, the 1st West York were assembled on the expected invasion of the French, and have received at different times in this century the thanks of the Government, the House of Lords, the King, and the Queen for their eminent services.

In 1814, when the Volunteers were disbanded, many of the Yeomanry Cavalry were allowed to exist under regulations providing that they should be called out for short periods of exercise every year. Several regiments were at different periods disbanded and enrolled again, and when regiments were a short time ago given an order of precedence, the date of formation of each corps was taken from its last embodiment.

In 1828, the Yeomanry establishment was remodelled, and regiments disbanded in districts where there was no reason to apprehend disturbance.

In 1830, the Wiltshire Yeomanry were made Royal for their services during the riots.

In 1842, the Staffordshire Yeomanry did duty during riots for six weeks.

In 1842-43, the Pembrokeshire Yeomanry were on duty for many months in connection with riots in Wales.

In 1848, the Royal Bucks relieved the Life Guards at Windsor, and performed the cavalry duties during the absence of that regiment at the Chartist riots.

The Yorkshire Hussars have frequently been called out in aid of the civil power, and I have no doubt many other corps could give an equally good account of themselves.

For many years very little was required of Yeomanry regiments, and they did not earn a high reputation for efficiency, but if successive Parliaments were remiss enough to go on paying regiments the contingent allowance for non-eficients, it could hardly be expected

that regiments would be so virtuous as to refuse to receive it, especially as the allowance was only sufficient to maintain the regiment when it was granted for all its enrolled members, whether efficient or not; now that the allowance is given for efficients only, it does not cover the expense.

In 1871, the command of the Militia, Yeomanry, and Volunteers was vested in the Crown and War Office, and from that time matters have assumed a more businesslike form, and if the numbers have gradually decreased the efficiency of what are remaining has certainly increased. Two Inspectors of Yeomanry were appointed, one for Scotland and North of England with headquarters at York, and the other for South of England and Wales with headquarters at Aldershot.

A School for Auxiliary Cavalry was also established at Aldershot with a Commandant, to which Yeomanry Officers are sent to qualify for promotion, and also non-commissioned officers belonging to the permanent staff are sent from time to time to rub up their military knowledge; this plan worked well for some years, and under it Yeomanry steadily improved. An Inspector coming for five years to a regiment was able to suggest improvements and see them carried out, and regiments felt they had a recognized authority to whom they could look for advice and instruction in their various difficulties. To the dismay, however, of the regiments in the Southern District of Yeomanry, it was learnt last year that the office of Inspector of Yeomanry was to be abolished, and that their correspondence and inspection was to be carried on by the Inspector-General of Cavalry. Though no doubt the Yeomanry deemed it a high honour to be commanded by the present Inspector-General of Cavalry, and to be assimilated with Regular cavalry, it was quite evident from the outset that it would be a retrograde step, which it has turned out to be. The Inspector-General of Cavalry cannot possibly find time to inspect the regiments of Yeomanry without neglecting the regiments of cavalry, as all inspections take place much about the same time, and the duty is now carried on in the Southern District, as formerly, by any cavalry Colonel who can be conveniently caught for the duty, as well as by the Inspector-General of Cavalry.

Yeomanry Cavalry Officers do not like troubling a General Officer, who has so much else to do, with their minor affairs, besides which the office of the Inspector-General of Cavalry is essentially an inspecting office, and the Inspector and his Staff Officers are absent a great part of the year inspecting regiments in England, Ireland, and Scotland. Cavalry regiments send in their correspondence relating to inspections on cavalry matters only, to the Inspector-General of Cavalry's office, whereas every description of correspondence from Yeomanry has to pass through the Inspector-General's office before it goes to the district, and before a paper gets to the War Office it goes to the Horse Guards, Whitehall, down to the district headquarters, and up again to the Horse Guards, Pall Mall; in fact, the organization of the Southern Auxiliary Cavalry District is quite contrary to the usual principles of organization.

I would suggest a rearrangement of the Staff of Yeomanry as follows :—

The General Officer Commanding Cavalry Brigade at Aldershot to command the whole of the Auxiliary cavalry as well as the cavalry brigade at Aldershot.

With three Staff Officers, A.D.C., Brigade Major of Cavalry, as at present, Brigade Major of Yeomanry (who would be the present Commandant of School for Auxiliary Cavalry).

The Yeomanry to be divided for inspection into three districts :—

1. *Northern Yeomanry District*, to comprise the North British and North-Eastern Districts, with thirteen regiments of Yeomanry and two light horse.

Inspector, the Officer Commanding Regimental District at York.

2. *Central Yeomanry District*, to comprise North-Western, Eastern, Thames, and South-Eastern Districts.

Eleven regiments of Yeomanry.

Inspector, the Officer Commanding Regimental District at Norwich.

3. *Southern Yeomanry District*, to comprise the Western, Southern, and Home Districts.

Sixteen regiments of Yeomanry.

Inspector, the Officer Commanding Regimental District at Hounslow.

The three Officers Commanding these regimental districts to be always cavalry Officers.

The correspondence of Yeomanry to go to the headquarters of the district in which their own headquarters are located, and on purely cavalry matters direct to the General Officer Commanding Cavalry at Aldershot, or in exactly the same way as correspondence of cavalry regiments goes now, instead of being diametrically opposite to it.

By this arrangement the Inspector-General of Cavalry would be relieved of the work which it is utterly impossible for him to do.

The General Officer Commanding Cavalry at Aldershot would have the general supervision of Yeomanry given over to him in place of the inspection of the cavalry regiments in England and Scotland recently transferred to the Inspector-General of Cavalry. He would also have direct authority over the School of Auxiliary Cavalry at Aldershot, and the Yeomanry would have a General Officer of high standing to advise on Yeomanry matters, and one who, in all probability, would have had previous experience of Yeomanry from having been one of the three Inspectors, as it is to be supposed that the Officers most likely to get high cavalry command would be appointed to one of these posts, which I have specially placed where cavalry are stationed, so that they may keep touch with their own branch of the Service.

The Staff Officer, called the Commandant of the School of Auxiliary Cavalry, would become the Brigade Major of Yeomanry Cavalry, and conduct the cavalry correspondence of the Yeomanry; this would give him more regular work instead of only when classes are formed. I cannot say that I think the training at the School is

altogether satisfactory as far as the Officers are concerned ; they get the theory and not the practice of the work, and from leading nothing but skeleton ranks they are quite at sea when placed in front of a troop or squadron ; they cannot be taught there how to command men, and by the School coming more directly under the General Officer Commanding Cavalry Brigade I think he would be able to devise a better system of instruction and give more opportunities for command, as the whole expense of Yeomanry is utterly thrown away if the Officers are unable to command and lead their squadrons.

I think also that the three Yeomanry Inspectors might be able better to arrange for those Officers of Yeomanry anxious to get on in the Service to attend drill with the cavalry regiments where they, the Inspectors, are stationed. There have been many first-rate leaders who were Yeomanry Officers and never served in the cavalry, and I dare say there are still, but they do not get any chance now at the School, and they require encouragement and facilities.

This arrangement would not be an increase of expense, but would, on the contrary, be a large saving, as the work would be distributed into a greater number of offices, and a large expense connected with two special Inspectors would be saved, and I venture to think it would be a proper organization, and result in benefit to the Yeomanry Service.

In 1888 an Act was passed enacting that every corps of Yeomanry shall be liable to be called out for actual military service to serve in any part of Great Britain ; this was enacted to apply only to men who joined after the Act was passed ; on the men, however, who had joined before the Act was passed, being asked if they consented to its application to themselves, they readily did so. I believe it might be found very useful if the words "and Ireland" were added to Great Britain in the above Act.

I consider it a serious drawback that a Yeoman receives no encouragement to serve ; many men can be found to serve for honour, glory, and pay, some for honour and glory only, but few for honour, glory, and expense. In searching about for inducements to join the Yeomanry, I would propose that, as a Yeoman offers not only his own services but that of his horse, he should be allowed to keep the two-wheeled vehicle which that horse draws free of tax ; also that a Yeoman should be excused sitting on juries ; the Yeoman belongs to a class which generally employs labour, and the loss of a day means to him not only the loss of his own time and that of his horse, but the suspension more or less of his business.

I would extend this privilege to the Militia and Volunteers ; it is not fair that those who elect to serve their country in the military department should be compelled to serve in the civil as well. Take, for instance, two tradesmen, one inspired with military ardour and ready to fight in defence of his country ; he has to give up a great portion of his time every year for preparation for the fray, and has in addition to spend his time in sitting on juries ; his neighbour has to be absent from his business for the jury work only, and therefore scores and probably crows over his more patriotic rival in trade. Is

that fair? I feel certain that if the sense of the nation were taken as to the fairness of it, the answer would be emphatically, No; the extra duty imposed on the non-military part of the community would be quite inappreciable, especially as the percentage of men belonging to Volunteers who are liable for jury service is very small, and Militia still less.

I think, like a great many others, that every Englishman, if not incapacitated, ought to serve in either the Army, Militia, Yeomanry, or Volunteers; but, as I know that no Government would dare to try to pass that, I go in for a very simple, inexpensive, practical, and, I think I might even say, popular scheme.

All the branches of the Auxiliary Forces are dwindling away, and they do really want some inducement to encourage men to join, in the way of lessening civil duties when they undertake military ones; even if they were kept on the bottom of the list for juries, &c., and only called when absolutely necessary, or when they fail to make themselves efficient, it would be a step in the right direction.

Finances.

Now as to the financial part of the business; an allowance is given of 2*l.* per annum for each efficient to be expended as follows:—

- a. Expenses of orderly room.
- b. Expenses of drill ground or riding school.
- c. Expenses in connection with troop and regimental stores.
- d. Postage and stationery.
- e. Clothing.
- f. Accoutrements, saddlery.
- g. Repairs of clothing.
- h. Ranges and expenses in connection with rifle practice.
- i. Conveyance of baggage to and from place for permanent duty.
- j. Veterinary expenses.
- k. Cost of all supplies received from the War Office on repayment.
- l. Extra pay of trumpeters for squadron at permanent duty.
- m. Cost of hire of horses for the use of the permanent staff, or of the band during permanent duty.

With the above formidable list of expenses, is it any wonder that a regiment cannot make the allowance of 2*l.* per man per efficient cover it, and, as a Yeomanry Commanding Officer expressed it to me, there was nothing for it but a "cheery prospect of bankruptcy." Well, what happens? A statement of the receipts from Clothing and Contingent Fund, and expenses as per above, is sent in annually by regiments to the War Office, which is duly audited and passed (in my case, at all events, with a large deficit) which the War Office does not pay up, though it approves of the expenses, but the deficit has to be made up at the regimental bankers from the Officers' private account, so that practically and morally the War Office owes that ever-increasing debt to the Officers' private account of each regiment.

This cannot be considered a creditable affair that Officers should have to pay out of their own pockets to maintain a force in defence of

the Empire, and I would suggest that a Committee should be appointed by the War Office to examine a certain number of regiments' accounts, and see what the expenses of a regiment really are, and how much the allowance should be increased to enable a regiment to be maintained by the allowance. The Committee would have to establish a fair price for uniform, &c., as, of course, if a regiment chooses to keep up a very expensive uniform it ought to pay for it.

The Volunteer allowance has of late been increased a great deal, and I find from the printed accounts of one regiment that no less a sum than 2*l.* 17*s.* 3*d.* per man was earned. As a Yeomanry Commanding Officer, I should be very pleased to receive that amount for a mounted corps.

I will now draw a comparison between the allowances given to Yeomanry and Volunteers.

The allowances for Yeomanry amount to 2*l.* per annum per efficient, to be expended as stated above.

The allowances for Volunteers are 35*s.* for higher grant, 10*s.* for lower, and, in addition, 30*s.* for Officers who pass in tactics, 30*s.* for non-commissioned officers and men who pass in signalling, 4*s.* per man for musketry, 12*s.* per man for equipment, 50*s.* for Officers and non-commissioned officers who pass for proficiency certificates, 2*s.* per man for great-coats, and about 50*l.* a year per regiment for stationery.

The allowance for Volunteers is quite on the right principle, viz., that the harder they work the greater grant they can earn; but the comparison shows that a Yeomanry regiment, with all its greater expenses as a mounted corps, cannot earn more than 2*l.* a man per efficient, whereas a Volunteer regiment can earn, at all events on an average, 2*l.* 17*s.* 3*d.* per efficient, and a good deal more if it worked still harder.

The requirements for a Yeoman to become efficient are:—

Six squad drills (mounted or dismounted).

Five mounted troop drills, or four troop drills if held on the two days preceding the eight days' permanent duty.

Recruits must attend twelve drills.

Yeomen prevented by sickness, &c., may qualify by attendance at three squad drills and musketry.

I think these requirements are ridiculously small, and if the grant were increased I should largely increase the requirements, and let it be thoroughly understood that if they do not become efficient they must make good the efficiency allowance which they lose to the regiment.

Officers used not to mind, I believe, supporting a regiment when they could do pretty well what they liked; but now, when they are under strict control and inspection, &c., they are not willing to contribute to the necessary and recognized expenses of a regiment, which ought to be defrayed by the nation.

Organization.

Now, with regard to organization, I cannot say that I think the Yeomanry are, as a whole, so perfectly organized that they are fit to go anywhere and do anything; most regiments are miserably weak and attenuated; there is a good rule now, that any regiment under 200 can be disbanded; I would go lower down to the root of the evil, and boldly say that every troop which had not 20 non-commissioned officers and men efficient should be at once disbanded. I believe that if there was any spirit in a troop, and it got down near the fatal number, every Officer, non-commissioned officer, and trooper would set to work to recruit; if there was no spirit in it, it would collapse, and the remaining men would be able to join the nearest troop and swell their ranks. A weak troop is an expensive article to the country, and a useless one to a regiment, and I believe, by a rule of that sort, much money would be saved and much efficiency gained. I suffer a good deal from some attenuated troops, and I know the men suffer too; they enjoy a drill with plenty of men, and feel ashamed of their numbers when there are a few. I have held several combined drills of troops this year, and find they answer well.

I am not at all a believer in strong regiments of Yeomanry, and I have no faith in regiments made up by pressure from their landlords; I believe their service is given grudgingly, and they do as little as they can. I believe strong regiments of Yeomanry are unwieldy and more than a Yeomanry Commanding Officer can manage, and, if so, they are not only expensive, but not worth the expense. I should much prefer to see little regiments of three squadrons, but these squadrons of a proper strength, viz., forty-eight front, and where counties no longer can supply a sufficient number of the right class of Yeomen, a regiment might be made up of a good squadron from each of three adjoining counties, and a county could easily keep up to its proper strength a good squadron of first-rate men. I find it difficult now to get 150 men in Hampshire; I should find it easy to get 100. I have 50 men in Surrey, and I believe another 50 could easily be got there, and I hope to get 100 in Sussex, and there would be the makings of a smart little regiment, with three good squadrons, which could always be kept up to their strength without undue pressure, and would have a wide local knowledge of country. Surrey and Sussex have no Yeomanry regiment belonging to them, and I have no doubt that the same principle could be applied in other counties.

I should like to see the squadron organization introduced into Yeomanry; make three divisions in a squadron according to what is called the new drill (but which I was taught in the 10th Hussars, under Colonel Baker, twenty-eight years ago); these three divisions would replace three small troops, with two Officers, one squadron sergeant-major and a paid Yeoman sergeant in charge of each division; this would not materially alter the organization, as small troops would become divisions, and very large troops might become squadrons split up in divisions.

I believe the greatest good would come from this arrangement ; I happened to be Adjutant of the 10th when the regiment was formed in the squadron organization in quarters, as well as in the field, and it simplified the work from the Colonel down to the orderly corporal in a wonderful manner, and in Yeomanry I believe it would be equally advantageous if properly organized. I consider giving a Yeoman sergeant a certain allowance per annum for the superintendence of his division, under an Officer, would give him a great interest in keeping up the strength and efficiency and recruiting of it, and if the division did not prosper it would be a simple matter to place another sergeant in charge of it. There would be one sergeant-major instead of three, which means a saving of 208*l.* a squadron, minus the allowance to three paid Yeoman sergeants, say 10*s.* for each efficient per annum ; the three divisions would be assembled for drill together occasionally and receive real benefit from such a drill, instead of the small troop drills which generally take place. The establishment of a division should be 33, and a squadron 100, and a regiment 200 or 300.

The present establishments of regiments vary in a truly marvellous manner ; they are as follows :—

There are 11 regiments, 251 of 4 troops each.

2	"	313	"	5	"	"
1	"	291	"	4	"	"
9	"	375	"	6	"	"
1	"	381	"	6	"	"
12	"	434	"	8	"	"
1	"	405	"	6	"	"
1	"	498	"	8	"	"
1	"	341	"	10	"	"

39 regiments in all with 9 different establishments.

Making an establishment of 14,086 all ranks.

Of which there were effective on January

1, 1891 10,830 " "

And present at training, 1890. 9,251 " "

Costing, according to Army estimates—

Pay of permanent staff	.....	£ 21,500
Pay of Yeomen	.....	31,400
Contingent allowances, &c.	.....	19,910
Miscellaneous charges	.....	1,600
	.....	74,410

I propose to have

14 regiments of 18 Officers, 200 sergeants, rank, and file, 2 squadrons each.

25 regiments of 25 Officers, 300 sergeants, rank, and file, 3 squadrons each.

	Low establishment.	High establishment.
1 Lieutenant-Colonel.	1 Lieutenant-Colonel.	1 Lieutenant-Colonel.
2 Majors commanding squadrons.	3 Majors commanding squadrons.	3 Majors commanding squadrons.
6 Lieutenants commanding Divisions.	9 Lieutenants commanding Divisions.	9 Lieutenants commanding Divisions.
6 2nd Lieutenants.	9 2nd Lieutenants.	9 2nd Lieutenants.
1 Adjutant.	1 Adjutant.	1 Adjutant.
1 Surgeon.	1 Surgeon.	1 Surgeon.
1 Veterinary Surgeon.	1 Veterinary Surgeon.	1 Veterinary Surgeon.

18 25

This would give an establishment of 11,010 all ranks.

The permanent sergeants would be reduced from 239 to 142, allowing 1 sergeant-major for each squadron, as well as 1 regimental sergeant-major for each regiment to do the clerking, &c.

The senior Captains would be promoted Majors, commanding squadrons, no seconds in command, and no Captains, but the divisions commanded by Lieutenants, assisted by second Lieutenants.

To show the costs of such regiments, I take the form from p. 182, Army Estimates, 1891, Recapitulation and Pay (see next page).

The saving from such an arrangement would be mainly from reduction of number of permanent sergeants, which, to a certain extent, would be counter-balanced by pay for Yeoman sergeants in charge of divisions. Thus—

	<i>£ s. d.</i>
239 permanent sergeants (p. 182, Army Estimates)	17,092 15 6
142 permanent sergeants	10,113 12 0
 Balance saved	 6,909 3 6
Deduct pay for Yeoman sergeants, arrived at in this way, on p. 38, Army Estimates ..	4,362 0 0
9,175 efficient draw clothing and contingency allowance.	
142 deduct for permanent sergeants.	
 9,033	
308 deduct for Yeoman sergeants.	
 2)8,725	
4,362, the allowance at 10s. per efficient for Yeomanry sergeants.	
 Deduct for difference in establishment of Officers.....	 2,547 3 6 170 8 8
	 2,376 14 10

Recapitulation and pay.							Total pay.		
	Daily rate.	Pay for 8 days.	Pay for 365 days.	Numbers permanent staff.	Numbers Yeomanry.	Yeomanry.	£.	s.	d.
Lieutenant-Colonel	£ 1 3 0	9 4 6	..	..	39	358 16 0			
Majors.....	0 19 3	7 14 0	..	..	103	793 2 0			
Lieutenants	0 10 0	4 0 0	..	..	309	1,236 0 0			
2nd Lieutenants	0 8 0	3 4 0	..	..	309	988 16 0			
Surgeons	0 11 4	4 10 8	..	..	39	176 16 0			
Veterinary Surgeons.....	0 8 0	3 4 0	..	..	25	80 0 0			
Sergeants, Yeomanry	0 7 0	2 16 0	15 0 0	..	308	4,635 0 0			
Rank and file, Yeomanry.....	0 10 0	..	182 10 0	25	9,772	27,361 12 0	4,6562	10	0
Adjutants	0 7 0	..	127 15 0	14	..	..	1,788 10 0		
Permanent sergeants.....	0 3 10	..	69 19 2	142	..	..	3,984 1 8		
	0 3 2	1 6 4	..	..	181	10,829	35,630 2 0	16,464 12 0	
Total Yeomanry Cavalry.....							11,010		
Add for additional pay and pay for troop drills, extra marching days, &c., and for leap year.....							5,351	6	8
Deduct for the pay of men deficient and of probable absences, &c., and difference of pay for corps called out for training and exercise only, also pay of permanent staff at lower rates							40,981	8	8
							5,059	0	0
							35,922	8	8
							14,590	16	6

To show the total cost of Yeomanry on that scale, I borrow the form on p. 38 of same estimates.

	£	s.	d.
Pay of permanent staff	14,590	16	6
Pay of Yeomen	35,922	8	8
Contingent allowances, &c.	19,910	0	0
Miscellaneous charges	1,600	0	0
	72,023	5	2

Instead of 74,400*l.*, as at present estimated for, or in other words, a reduction of 2,376*l.* 14*s.* 10*d.* for the same number of effectives, though a reduced establishment.

To the above saving must be added the saving of two separate Inspectors of Yeomanry and their Offices (as though one is temporarily abolished, it must be given back), and there would be a sum of between 3,000*l.* and 4,000*l.* to increase the efficiency of the Force.

I would suggest spending the saving in longer permanent duty and more pay for troop drills; fourteen days' permanent duty instead of ten days, into which, now, everything has to be crammed; also allow pay at the rate of 7*s.* a mounted squadron drill a month, with power to combine two or three drills into consecutive drills at Easter, or other manœuvres, &c.; I say 7*s.* for drills because the men may have to go long distances for combined drills of squadrons.

I feel confident there would be many splendid serviceable little regiments which, if properly equipped, would be equal to any service; the strong regiments would be reduced in numbers but increased in efficiency, and the present weak regiments would be increased in both numbers and efficiency; in fact, I would go in for the principle of what you do do well. Also, a higher standard of efficiency ought to be demanded, say attendance at ten out of fourteen days' permanent duty, paying only for the days the men are present, six mounted and six dismounted drills, during the year. This proposal would, I am well aware, more than swallow up the small saving made, unless the extra stringency reduced the numbers of regiments and men and so placed more money available for paying better those who are willing to become really efficient.

I do not advocate any great change in the way of attaching regiments of Yeomanry to Line cavalry regiments, as I do not consider such a scheme would be in the least applicable, for the simple reason that men who join Yeomanry regiments are men who have some property or business to attend to, and are never likely to want permanent employment in the Army; and, therefore, I consider that Yeomanry would be only a drag upon the Line, without rendering them any assistance in the way of recruiting, although I consider they might be found a very useful auxiliary, and capable of taking their place in case of their absence or temporary effacement.

I cannot too highly praise the Yeomen who do pay attention to their drills and their duties; it is a great pleasure to instruct them, and to be associated with them; they are exceedingly intelligent,

keen to learn, and take to the trade of soldiering with wonderful avidity, but they want to bear in mind that the work is not now all beer and skittles, and that if the Force is to be kept up, the members of it must put themselves oftener to personal inconvenience to attend drills and manœuvres ; they must not be contented with coming out for permanent duty at their county towns and swelling about—that is all very well now and then—but they should lose no opportunity of joining in any manœuvres which may offer in combination with other troops, and then, when the country sees that the Yeomanry as a Force is worth its salt, I believe there will be no unwillingness on the part of the Government of the day to vote the money to place it on a basis which will enable it to be kept up without so much expense to its Officers and its members.

Riding Schools.—There is one thing which I have always been anxious to introduce, and that is troop riding schools. I believe it would be the making of a troop, and should, with a good troop committee, be made to pay its way ; I would establish a troop club at the school, have quarters for the sergeant-major, and allow him to give lessons to civilians. All Yeomen are the better for riding school drill ; they may be good riders across country, which, perhaps, the majority are, but they are utterly innocent of all the aids necessary to ride and manage horses when in a body, which for ease and comfort to themselves and rapidity of movement of a body of horsemen is so essential.

Shooting.—The next most important thing to riding is shooting, and this, I regret to hear, is not a very popular part of their duty, and as it is so important, I consider that, if the permanent duty time was prolonged as I am suggesting, it should be done during that time, and so become one of the paid drills and a qualification of the efficiency grant, or a fine from absence for it. It is impossible to carry out the musketry properly, except at permanent duty.

Since the efficiency rules have been made stricter, I have found it necessary to enforce the fines laid down by Act of Parliament for absence from the parades which constitute efficiency ; this, of course, is not popular, but it stands to reason that a regiment cannot afford to go on clothing and paying expenses for men who do not earn the grant, the value of which has to be expended upon them, although they are not efficient.

Camps.—When practicable, it would be very beneficial if regiments could be brigaded together and go to camps where there are other cavalry ; in Hampshire we are fortunate, as we have Aldershot, to which we go every other year, and the men reap the greatest benefit from seeing other cavalry regiments.

Equipment.

Now for the equipment of the force.

I consider the best head dress for the force is a helmet of some sort or another. To begin with, it makes a man look soldier-like at once. He must hold his head up or he cannot see ; it is a good dress

in all weathers if used without a plume ; some like a plume because they think it looks pretty, but, although it may, it spoils the comfort of the helmet, as in a wind it drags it on one side and adds much to its weight ; the disadvantage of a helmet is that it glitters so much, but that could easily be obviated on service by darkening it.

Pouches.—I dislike the way we all carry our ammunition, viz., in a pouch at the back ; the ammunition is much shaken about in it, and it is difficult to get at, but as the pouches and belts would cost a great deal to renew, as they look well and are like the Regular Cavalry, I have to be content with them.

Tunic.—For a tunic I consider one not made to fit tight in at the waist is the best, and so that a waistcoat can be worn under it, and it should have very little lace upon it ; the smart jacket should be the one which is worn for walking out, parties, &c., and may be plastered with lace according to taste and the capability of the private fund.

Pantaloons and Boots.—Cloth overalls and Wellingtons or side-spring boots form a suitable and necessary covering for the lower limbs.

The prices for the various articles of equipment in Hampshire Carabiniers are as follows, which may be useful in comparison with others :—

	£ s. d.
Helmet.....	1 5 0
Tunic	1 4 6
Jacket	1 3 6
Overalls	1 2 0
Pantaloons	1 3 0
Saddlery	6 17 2
Cloak and belt	1 11 0
Forage cap	0 4 6

Now a word about the arms. We are at present armed with the Martini carbine, which is carried in a carbine bucket on the off side, and a very old Regulation sword on the near side of the saddle ; many say, What a stupid arrangement ; because if a man is parted from his horse he is left without a weapon to defend himself with. Well, if he is near an enemy the probability is he would have either his sword or his carbine drawn, which would therefore accompany him on to the ground ; but there is no doubt that men are very much fresher at the end of a hard day's work for not having a sword dragging at their loins or a carbine at their back, and their agility when working on foot with carbines and without swords is astonishing as compared to when they are hampered with a sword as well. A man also falling with a carbine on his back is liable to hurt his carbine as well as himself.

Now as to the weapons themselves. The carbine is a first-rate weapon and very accurate up to 600 yards ; beyond that they may not be so accurate for firing at a target or individuals as a long rifle, but for firing at bodies of men they are every bit as good, and therefore I

sincerely trust we may never be obliged to hamper ourselves or our horses with the long rifle.

The sword used is a very old one, and I have fought hard to get new swords, and several times been on the point of receiving them; but some unlucky chance letter from the Ordnance Store Department has always prevented it; they are also not suitable for carrying attached to the saddle.

Saddlery.—This is a part of the equipment in which, perhaps, I take the most interest. When I came to the command of the Hampshire Yeomanry I found the men using their own private saddles, to which D's had to be attached for hanging everything to; the result was that the annual repairs bill was enormous and a sound back an exception; I luckily found a large balance in the regimental private account, which I promptly spent in getting a complete outfit in saddlery, and introduced a system I had worked at for a great many years, and which was finally approved for the Army by His Royal Highness, in a Horse Guards letter dated 13th April, 1887 (but which has never been introduced into the Army except as an experiment, and which experiment was completely successful).

In this system I use the Regulation pattern saddle, seat an inch longer and one or two other improvements, no pannels to the saddle, but instead a horse blanket and a numnah cut in a peculiar shape so as to be reversible. I could fill pages on the question of saddlery, but will refrain, as my lecture is already too long; suffice it to say that the equipment has given very great satisfaction, and we have literally no trouble about the horses' backs, notwithstanding that the same saddle has to fit every and any horse its rider brings, and their name is legion. Often horses are brought to a training whose backs have no previous preparation for saddles, they being harness horses; also Yeomanry have very long days out; at least I generally keep my regiment out in the field from 9.30 to 4 or 5 P.M., and they are kept pretty busy during that time. I have tried them also with long-distance rides. Last year a party started from Southampton Easter Sunday night, and marched to Winchester, 12 miles; left Winchester 5 A.M. next morning, and reached Kensington Barracks, in London, 5.55 P.M. same date, a distance of 65 miles straight on end in 12 hours 55 minutes. Another party of the Isle of Wight troop left Havant at 5.15 A.M., reaching Kensington at 8.15 P.M., 65 miles in 15 hours; and a third party left Basingstoke at 8 A.M., reaching Kensington at 4.15 P.M., a distance of 48 miles in 8½ hours. I saw all the different parties on their arrival in London; their horses' backs were in perfect order, not even puffed, and both men and horses were wonderfully fresh. The men averaged about 16½ stone with their accoutrements, and were in marching order. I have entered into this in detail, as I think it was such a creditable performance not only to the equipment but to the Yeomen and their horses. I have heard of a troop of cavalry thinking 40 miles rather a long day's march, but this was 65, and the horses were fit again next morning. They returned home early so as to get back again to their business. I fancy I hear my friends of the cavalry saying it is

all very well with a few picked men to do these long rides; of course the worst men may not have done it, but there is no picking and choosing in Yeomanry; at present you have as a rule to take whoever will come, but with a small and liberally paid regiment which I have sketched out under the head of Organization, I maintain they would be all picked men and would form a good useful auxiliary to the cavalry, unlike the present Reserve, formed by sending away the best men from their regiments, who never reappear as useful cavalry soldiers.

Its Future Utility.

We have seen at the commencement of the lecture what has been the past utility of the Service, and I do not see why, with all the advantages under which it is being placed, it may not double its utility in the future. Although there is a great dread of being turned into mounted infantry, I cannot discover that there are many advocates for this transformation; the two Services, as a great mounted infantry authority, Colonel Hutton, points out, are not rivals, but intended to work in conjunction with one another. I had the pleasure of having under me at the Easter Volunteer Review a small force of the 4th V.B. the Queen's Royal West Surrey Regiment, together with a detachment of our county Yeomanry and some cyclists of the Royal Marines. I found that the Yeomanry could do a great deal more for being supported by mounted infantry, and the mounted infantry did a great deal more from being guarded and scouted for by the Yeomanry. We were enabled together to take up a certain position at great speed where enemy's guns intended to have come, and we prevented a brigade of infantry from making a flank attack which might have turned the fortunes of the day, simply because our dismounted infantry looked like real infantry in position, and our Yeomanry prevented the enemy's cavalry from finding out what they really were. Lieutenant Gethin, who was in command of the mounted infantry referred to, says, writing to me afterwards: "If you have cavalry or infantry working with you, you need fear nothing; having our flank protected by your men, we were able to fire volleys into the enemy's companies as they advanced up the valley. Having cavalry with them enables mounted infantry to leave their horses safer under cover and further in rear. Yeomanry are full of dash, and this would not be improved by any new restrictions or alterations in equipment."

"We have to be very careful that the sights of our rifles do not get injured, which they are very liable to do if a man, when mounted, jumps a hedge with rifle slung across the back, as the sight is apt to come in contact with the saddle, but if rifle is properly in bucket it is all right."

Major James, in a lecture given on the development of modern cavalry action in the field, made some disparaging remarks on Yeomanry, which, by certain high authorities, were not considered very wise. He had just been advocating that cavalry and mounted

infantry should work harmoniously side by side, and in the next breath advocated turning Yeomanry into mounted infantry. Where, then, would be the cavalry for the mounted infantry (late Yeomanry) to work with ; and this force would then have no support in the way of cavalry to do their scouting, outpost, or protection duty ? I consider, though, that there are not many places capable of supporting both mounted infantry and Yeomanry, but as Forces I think they are most excellent in combination.

Of course, the real utility of Yeomanry would be, in case of a great European war, in which we might be engaged, and our small force of cavalry would all be employed, then the Yeomanry would have to be embodied at home, to take their place and for the preservation of order, which might at that time become threatened. The Duke of Wellington, talking of Yeomanry, said it is much more desirable to employ cavalry for the purposes of police than infantry, and for this reason, cavalry inspires more terror at the same time that it does much less mischief ; a body of 20 or 30 horse will disperse a mob with the utmost facility, whereas 400 or 500 infantry will not effect the same object without the use of their firearms, and a great deal of mischief may be done. It would also be required in case our forces abroad met with a reverse, and the enemy turned the tide of war towards our shores ; by that time the Yeomanry, having been for some time under training, I maintain would be a most efficient rough and ready cavalry force, who would give a good account of any foe who came against them, and would form the only reserve to our cavalry which exists.

The following is a summary of the recommendations which I have made in the course of this lecture :—

Recommendations.

1. I propose (as inducements to joining the Force) that a Yeoman be allowed to keep a two-wheeled trap free of tax, and that he should be excused sitting on juries.

2. That the General Officer Commanding the Cavalry Brigade at Aldershot should be given command of the whole Yeomanry Force, with the present Commandant of School for Auxiliary Cavalry as Brigade-Major of Yeomanry, and three Inspectors, one the Officer Commanding Regimental District at York, one at Norwich, and one at Hounslow.

3. That the allowance per annum per efficient be increased to, at all events, as much as is obtainable now by Volunteers, and that a Committee be appointed to discover what the expenses of a regiment really are, so as to determine the proper allowances, which I consider should be 3*l.* per man.

4. That the squadron organization should be established, each squadron to consist of 3 divisions, each under an Officer and a paid Yeoman sergeant, with 1 Major and 1 squadron sergeant-major, each regiment to consist of 2 or 3 squadrons according to the present number of troops in each regiment, or 2 or 3 adjoining counties to

form a regiment. Strength of a division, 33; a squadron, 100; a regiment, 200 or 300; not to be exceeded.

5. Permanent duty to be 14 days instead of 10 days.
6. That 7s. per mounted drill per month be granted, with power to combine two or three drills into consecutive days.
7. That the qualifications for an efficient be 10 days' attendance at permanent duty out of the 14; 6 mounted drills and 6 foot in addition, and to receive no pay on days when absent, except Sundays.
8. That riding schools be established, with club and quarters for permanent sergeants under regimental arrangements.
9. That shooting be performed at permanent duty, and form a qualification for efficiency.
10. That in the event of a man not becoming an efficient he should necessarily be fined 2*s.* to make up the loss of efficiency grant.
11. That regiments be brigaded together.
12. That the tunic be a loose simple garment, and the walking-out dress the smart one.
13. That the carbine be retained in preference to long rifle.
14. That the Yeomanry be given serviceable swords.
15. That regiments provide themselves with serviceable saddlery.
16. That the Yeomanry remain as cavalry, and not be turned into mounted infantry or rifles.

17. It might be difficult to try these recommendations on the whole Force at once, but I should be very glad to be experimented upon, and if successful they might gradually be introduced.

I have not touched on the subject of drill, as I consider we cannot do better than we are endeavouring at present to do in following the paths laid out for us by our Inspectors; we learn to fight mounted and on foot, and we also learn to march past. I am not one of those too far advanced soldiers who would like to see marching past done away with; I consider it means drill, and drill means discipline and cohesion, which are the most necessary accomplishments of any; of course in the short time allotted to us, a regiment should not waste too long a time over it. I consider the best routine for a day's work to be riding school drill, squadron movements by fours, squadron dismounted drill, regimental movements by fours, regimental drill, dismounted drill, outpost duty, marching past, and they should all be practised every day. I lay great stress on riding school drill; I know Yeomen turn up their noses at it, but it is wonderful how a little knowledge of passing horses right and left, and the use of the leg in moving by fours, facilitates and quickens movements; I hear people advocating never drilling with swords, or not drawing swords till the charge; that may be all very well when actually on service, but the men must be practised drilling with swords for three reasons, first to strengthen the wrist and accustom it to carry a sword, second to accustom the man to ride with one hand, and third to accustom the horse to be ridden with one hand, which he must do when the sword is drawn, viz., at the supreme moment of the charge.

Charging.

I hear also many people saying Yeomanry should never be taught to charge or drill in close formations. How can anyone be certain Yeomanry will never have a chance to charge; supposing the opportunity offers some day of infantry without ammunition or cavalry in loose order, or taken at a disadvantage, and a Yeomanry regiment is ordered to charge, what would a General giving this order think if the Colonel sent back word to say, "Yeomanry are not supposed to charge, &c."? No, I believe they ought to be taught to charge above all things; it gives them courage and dash, it makes the faint-hearted strong, and I believe a charge of a lot of horses together, whether Regular cavalry or Yeomanry, or cart horses loose in field, will always strike terror into those on foot who happen to come in their way.

I advocate doing away with the position of seconds in command, 1st, because for good reasons I presume they no longer exist in cavalry of the Line; 2nd, because I think they are more usefully placed, both for their own benefit in keeping up their knowledge of drill, and for the benefit of the men they command, in charge of squadrons; 3rd, I think a man is more capable of commanding a regiment if he goes straight from commanding a squadron than if he has been for some years in a state of animated suspension as Major watching the Adjutant dress the line.

I advocate doing away with Captains, which is, I confess, rather a wrench, because, I think, a squadron is more, and a division is less, than a Captain's command should be. I think it would be objectionable to have some divisions commanded by Captains and some by Lieutenants; I think if each division were commanded by a Captain he would look upon it too much as his own troop, and want to be independent of his squadron Captain, and which would reduce the benefits of the squadron organization.

I have advocated placing the Yeomanry on a proper footing, not merely because it is a loyal and Constitutional Force, but because I honestly considered that if properly organized, paid, made to do its duty, and take its place with or in support of the other forces of the Crown, that it is capable of doing so with credit, and will prove that it is well worth every consideration that can be given to it.

A distinguished General is reported to have said the other day that if a hostile force was landed on our shores they would bring very few cavalry, only a few squadrons for the purpose of getting information; I trust that would be the case; if it was, and we Yeomanry are still alive as a Force, we should not be worth our salt if we did not prevent these few squadrons from gaining one atom of information. If, on the contrary, our cavalry was reduced, and our enemy was to hear that we had a very small cavalry force in England, and they determined to bring a large force of cavalry, then they would get all the information and we should get none. I always heard that the force which has the most cavalry should get the best information. England may not be a very grand country as a rule for cavalry to manoeuvre over in masses, but from the very fact that it is such a

close country, it is all the more necessary to have an active force of mounted men than if it was an open country where you can see everything ; to lead the advance of the columns of an army, to gather information of the movements of the enemy, and to protect the army from surprise ; this can be done with certainty and success in all weathers and over all countries by cavalry only, supported as much as practicable by mounted infantry, bicyclists, &c., &c. ; but for an active screen in front of an army cavalry is *the Force*, and in the event of the absence of the Regular cavalry I believe the Yeomanry would be pre-eminently suited for the duty. Why then, may I ask, are the Yeomanry not included in the Mobilization Scheme ?

Will any one stand up and say that men well mounted and equipped, with a good knowledge of the country, would not be of inestimable value in leading columns through a country that they know thoroughly ? I was opposed to a force the other day with my Yeomanry, and I was led by one of the men for fifteen miles from the centre of the enemy's position, round their flank through the village they were defending, without being observed. We went through fields, bye-lanes, woods, &c., without a check, in a way which would have been impossible with map-knowledge only. Can any one say that a country full of Yeomen, strong, intelligent, determined men, on active, useful horses, would be an easy country in which a few squadrons of foreign cavalry could get information, their horses and men being quite unaccustomed to the country ; or that if a body of Yeomen, strong, heavy men on equally strong, heavy horses, were to have the luck or the foresight to hurl themselves upon foreign cavalry taken at a disadvantage coming up a hill, when they could charge down upon them, they would not scatter them to the winds ; but such opportunities do often occur and those on the defensive can choose their opportunities much better than those on the offensive ? I should say that with all the advantages Yeomanry would have on their side, they would walk round any foreign cavalry that could be brought against them in England ; pit them against foreign cavalry in France or Germany, and the odds would, I admit, be equally against them.

There is to be a mobilization in the Isle of Wight this month, and the Officer commanding one of the defence sections applied that a party of the troop of Yeomanry in the island might be told off to assist him, as he urgently required their services. I was exceedingly sorry not to be able to agree to it, as it was exactly the time of our annual training. But if mounted men are so much wanted for the defence scheme of the Isle of Wight, why, may I again ask, are the Yeomanry not included in the Mobilization Scheme of England ? I trust we may hear the reason why.

I fear I have been a little hard upon the regiments who may be strong, and who have worked successfully to keep up their numbers, but they are few and far between, and I have no doubt would be all the better for some weeding out. It cannot be denied that it is a struggle to keep up Yeomanry, especially as it is done on the same allowances now, when a great deal is expected from it, as it was years

ago, when nothing was expected of the Force; but the good of the whole must be considered in legislating for it.

I have advocated reducing strong regiments, because, 1st, I do not think large bodies of irregular cavalry are so useful as smaller; 2nd, by reducing strong regiments more money is available for making the whole Force more efficient, and for forming squadrons where none now exist, as, where a county finds it difficult to support a regiment, I consider it could easily keep up a squadron, and so form, as the Yeomanry always has done, an inexpensive nucleus of an expansive nature. Under these circumstances, I think it would be perfectly easy and very advisable for every county to have a company of mounted infantry as well as a Yeomanry regiment or squadron. It would then be a difficult Force to get into, and we all know how that helps to raise the standard of efficiency.

It seems incredible that there should be such counties in England as Northamptonshire, Lincoln, Rutland, Bedford, Cambridge, &c., without a mounted corps, and I feel confident that there are many cavalry Officers retired into the position of county squires who would raise and command most efficiently squadrons formed out of the cream of their counties. Times have changed in England, and squires' sons without occupation are rarely to be met with, so we must look now more for men as Officers who have served in the Army; these men cannot afford to spend so much on their troops as was formerly done; therefore we must look to the Government of the day, if after due consideration they agree to maintain the Force, the future utility of which I have tried to demonstrate, to allow sufficient money for keeping it up; and what has to be considered is, first, the amount which may be spent annually on the Force, and next what strength can be efficiently maintained for that sum.

I trust sincerely we may hear no more disparaging remarks from Officers who lecture, or members who speak in the House of Commons; they may rest assured that the Yeomanry Force is anxious to be placed upon a sound and permanent footing, which they feel now is unsatisfactory, and they are endeavouring to do their best, assisted by excellent Officers from the cavalry as their Adjutants, *to keep the Force going*; and I consider Yeomanry Officers, both past and present, deserve the thanks of the country for having *largely* out of their own pockets *helped to keep up a Force* which I trust may yet be found to be an efficient and real auxiliary to the cavalry which England is so justly proud of, but which she is content to see so small.

Colonel LONSDALE HALE: As a member of the Council I beg to say how sorry I am that there are not more members of that body present to listen to the lecture. The fact is that on the Council of the Institution now are a large number of Officers on the active list. They attend the meetings of the Council and the Committees, and therefore they do not find time to attend the lectures as they would like to do, and in a way that the Council used to do formerly. I feel sure that neither the lecturer nor the Yeomanry Officers will think the Council guilty of any want of courtesy or want of interest in the subject in not coming in greater numbers than they have to-day. The title of this lecture which we have heard from Colonel Crichton is "The Yeomanry and its Future;" and, therefore, it is open to anybody, even if he be not a Yeoman, who takes an interest in defence generally, to

offer a few remarks on the subject. The lecturer seems to have put the whole subject forward in rather a peculiar form. Before he read his additional manuscript I cast my eye roughly over the contents of the printed pages, and I find that he divides his subject into two branches, first, organization and equipment, and secondly, utility. If you will look at the printed pages you will find that he has given sixteen-seventeenths of his lecture to organization and equipment, and one-seventeenth to utility. In my opinion the question of organization and equipment is quite subsidiary to the other. What we want to find out to-day is the utility of the Yeomanry Cavalry. Moreover, organization means interfering with older organizations and also with expenditure of money. You must prove its utility, and then organization may follow. But the authorities will never allow any new organization or more expenditure on an old one until its utility is proved. I purpose addressing myself entirely to the question of, "the utility of the Yeomanry Cavalry in the future;" and, perhaps, in what I say I shall appear to drag the tail of my coat before the faces of many Yeomanry Officers here present; but the coat is an old one, and the cloth is very strong, and you can jump on it as much as you like; it will not hurt the coat much nor the wearer either. You may say, Why should an ex-Engineer talk about the subject at all? I have said in the course of my life something about cavalry occasionally; and I dare to do so again to-day, for the simple reason that I have studied in the closest way every branch of the work that the German cavalry did in the war of 1870—scouting and everything; and when I hear anything said about cavalry, or of anything being introduced into the cavalry, I recall to my memory some situations which have already occurred in war, and see how the proposed alteration fits in. And so I do with regard to the utility of the Yeomanry Cavalry of the future. What is the utility which the lecturer proposes to adopt for the Yeomanry Cavalry in future wars in the defence of the country? He means to keep them as cavalry. Now, there must not be any mistake as to what that word means when we use it to-day. Of course, cavalry must necessarily be able to fight dismounted as well as mounted; but a force which cannot fight mounted, which cannot charge knee to knee in perfect order, cannot be considered as cavalry. That is the test as to whether a force is cavalry or not: can you charge together and use the sword or the lance? Colonel Crichton wishes to retain this force as a cavalry force for defensive purposes. But who are they to fight in case of an invasion? We are all agreed that, although there is not much room in England for the movements of much more than a brigade in the defence of this country, occasions will occur over and over again when there is plenty of room for a couple of squadrons to come in contact with each other. Who are Colonel Crichton's cavalry to meet? Nothing but the picked cavalry of a foreign Power will be sent to this country; and can anyone believe that any amount of squadrons, whose utmost extent of annual training is even fourteen days, as the lecturer proposes, can possibly make the slightest impression on a trained squadron of European cavalrymen who have been trained three years, and who are led by the most practised cavalry Officers in the Service? I must say that I am one of those who do not believe that the Yeomanry Cavalry as such would hold their own for a minute against foreign cavalry invading this country. Then with regard to foreign infantry. I do not think that the foreign infantry, which have stood charges of regular cavalry even in open order, as the Germans did, would be very much afraid even of the Yeomanry—a crowd of horsemen charging against them in somewhat loose order. I do not think they would have much chance. I find that the point on which Colonel Crichton lays great stress is one upon which my friend Colonel Hutton also lays great stress—that they are such wonderful people for scouting. In the presence of an ex-Inspector-General of Cavalry I feel great diffidence in speaking upon this subject at all; but so far as I know anything about cavalry scouting it appears to me that there is no branch of their work that requires greater training, practice, and experience than cavalry scouting; yet we are told, in this particular branch your Yeomen are to excel. Now, in this lecture is a very remarkable paragraph. Colonel Crichton says: "I had the pleasure of having had under me at the Easter Volunteer Review a small force of the 4th V.B. the Queen's Royal West Surrey Regiment, together with a detachment of our county Yeomanry and some cyclists of the Royal Marines. I found that the Yeomanry could do a great deal

more for being supported by mounted infantry, and the mounted infantry did a great deal more from being guarded and scouted for by the Yeomanry. We were enabled together to take up a certain position at great speed where enemy's guns intended to have gone, and we prevented a brigade of infantry from making a flank attack, which might have turned the fortunes of the day, simply because our dismounted infantry looked like real infantry in position, and our Yeomanry prevented the enemy's cavalry from finding out what they really were." Who prevented them? It was the Umpire. I have myself, as Umpire, done the same at Kriegs-spiel. This was a peace manoeuvre. There was no test between them; it was simply the fiat of the Umpire. That recalls to me a certain incident which happened nearly twenty years ago. It was my fortune to be on the Staff of one of the infantry divisions at the manoeuvres at Blandford, and with our division, though we had no divisional cavalry, there was associated more or less with us one particular cavalry regiment. I remember on one occasion, probably among many, when the Commander of that cavalry regiment came in, in the evening, to Sir John Mitchell, who commanded us, and said, "I will be here at eight o'clock to-morrow, Sir John, and tell you where every bit of the Northern Army is." The Northern Army had been provided with any number of Regular cavalry regiments. At eight o'clock in came that Commander and brought in the information that he got round the well-trained regiments and found out where everybody in the Northern Army was. That Officer was Colonel Valentine Baker. The regiment he commanded was the 10th, Prince of Wales's, Hussars. Now we have the Colonel Commanding the Hampshire Yeomanry telling us that the Yeomanry can stop Regular cavalry from obtaining information. I wonder very much whether somebody now before us, who was probably a Subaltern or Adjutant of the regiment, or Captain of the 10th Hussars, held that opinion then—whether the 10th Hussars in those days would not have walked round any amount of Yeomanry Cavalry opposed to them.

Colonel Crichton: I may say that I was in the 10th Hussars in those days myself.

Colonel LONSDALE HALE: That is exactly the point I want to bring before you. You see the enthusiasm which has been shown by the lecturer, that whereas when he was in the 10th Hussars he got round a cavalry regiment at Blandford, but now that he is in a Yeomanry regiment, he is so enthusiastic that he declares that the old 10th could not do it.

Colonel Crichton: I did do it. I prevented this cavalry regiment, which was a Regular cavalry regiment, from getting the information they wanted. There was an Umpire present, it so happened, but he did very little, or nothing. It was entirely from having our Yeomanry round this little force which prevented the enemy, which was a Regular cavalry regiment, from getting information of what was behind us and the mounted infantry.

Colonel LONSDALE HALE: That is after all only a difference of opinion. Colonel Crichton asks in his paper, "What are you to do if all your cavalry is out of England?" My answer is that, if I have merely untrained cavalry to depend upon, I should prefer to be protected by mounted infantry, because I should know what the mounted infantry could do; but I could not rely upon badly or indifferently trained cavalry. At the same time there seems to be a very great future for the Yeomanry of the country. Let us call them cavalry. What is in a name? Colonel Crichton seems to think that there is a lot in a name; and so do many other people. We all differ on this point; therefore let us all keep our names. Colonel Crichton has mentioned the very great use it would be for the Yeomanry Cavalry to work in conjunction with the mounted infantry. But why should not you work in conjunction with cavalry? You are good riders; you are better riders than the mounted infantry, and why should not you learn that part of your work which you can learn very well, while you cannot learn the other part? Why should not you learn dismounted duties? Why should not the Yeomanry Cavalry of England be attached to Regular regiments? Just think what a Regular regiment of cavalry going into the field with its four squadrons, and having with it a squadron of Yeomanry Cavalry well trained in mounted infantry work could do! Of course the point is to dismount as few of the Regular cavalry as possible.

Compare that regiment with a regiment to which mounted infantry is attached. You cannot be sure that the mounted infantry can follow the cavalry all over the country; but you can be sure, from their own power of riding, that the Yeomanry will be able to do it. Therefore, I throw out the suggestion to the Yeomanry, that the rôle they should play in the defence of this country should be acting with cavalry regiments to which they will be specially told off to do its dismounted work. Of course all the other squadrons will be able to do it, but this is the special squadron for the work, and at a push we can use it as an ordinary squadron of the Regular regiment. I have only to refer to one more point, and it was mentioned at the Aldershot discussion. It was said by an Officer of great distinction that if the Yeomanry Cavalry ceased to become cavalry and became mounted infantry the men who officered them would lose all interest in them. If we look down the list of the Officers of those regiments, we find in them representatives of all the aristocracy and the territorial proprietors of the country. These gentlemen are now spending their money on what nine out of ten believe to be, I will not say a sham, but not of very great use. I have great faith in these classes, and I believe if the regiments they officer were turned into something really useful, and have to take a real part in the defence of the country, the first men who would be eager to push forward the work and do their duty would be the class of men I have mentioned.

Colonel GRAVES (20th Hussars): I cannot say that I agree with the view which my old friend and instructor Colonel Lonsdale Hale has put before the meeting to-day, from all points of view. There was a great deal of truth in what he said, but I think also there were a great many half truths. I think he has been a little bit uncharitable to the force to which I myself was attached for five years as Adjutant, and I think he should have borne in mind, in stating his views so precisely and emphatically, that the opportunities of the Force are rather small. Considering the limited nature of their opportunities for obtaining instruction and for doing the work of cavalry, the progress they make in that limited time is something extraordinary (Hear, hear). Now I happen to have been appointed to the Yeomanry as Adjutant at a time, I think I may say, of crisis, when there were very serious thoughts among the high Officers of the Horse Guards and the War Office of doing away with them. When I got down to Staffordshire and found myself Adjutant to what was the strongest regiment in the country, I saw that there was a very large stratum among them that with proper handling, encouragement, and instruction, would be very useful. I came to the conclusion that the encouragement they received from the country, and also from the authorities, was of a very meagre character, but that if they received one tithe of the encouragement which our Volunteers receive, they would have done a very great deal more. I am afraid I am not blessed with that quality which is so common to Irishmen, my fellow-countrymen, commonly called shyness, and I thought the higher I flew, the better for the cause I had at heart. I made so bold as to approach His Royal Highness the Commander-in-Chief at the time, and suggested to him very respectfully that it would be a good thing for the Force at large, both at present and in the future, if he would be gracious enough to inspect annually a regiment in the North District and a regiment in the South District. He received my suggestion with a great deal of surprise; but I am thankful to say, after giving me a tentative promise, he carried it into effect, and my regiment was the first regiment he inspected in his official capacity. He came down there, and we turned out five squadrons for him. We drilled in brigade, and there were altogether 510 rank and file on parade. We had not a single horse on parade under 15-1, and we had not a single grey horse in the ranks. I believe His Royal Highness' action in that matter has had a very material effect in encouragement in the right direction. Colonel Crichton has referred to the doing away with life-long appointments of Adjutants, and also the appointment of Inspectors for five years. I think there are several points which might have been touched upon in the lecture to-day with reference subjectively to the Yeomanry themselves. They are a peculiar force. Their prosperity, advancement, and enthusiasm too, I think, from my own experience, depend in a very large measure upon the personal influence of the Officers themselves. Now I may be, perhaps, treading upon the pet corns of some Yeomanry Officers here

when I say that I think that the command of troops and the command of regiments of Yeomanry should be absolutely by selection. I think also the men appointed to the command of troops and regiments should be men well known locally—should have local influence among the farmers and others in their own neighbourhoods. It is fatal to the interests of a troop to have a man who may be a Q.C. working at the Bar in London and having a troop of Yeomanry in Northumberland. That man, as a rule, will go to about one of the whole of his troop drills, and never be known amongst, or seen by, the men whom he has to command during permanent duty. That is a most important point which should be borne in mind. The matter came up when I was Adjutant of the Queen's Own Royal Yeomanry, in Staffordshire. Two Subalterns were recommended for promotion to troops. We received an official letter from the Horse Guards, to know why the senior Subalterns of the regiment were not appointed to the troops vacant. The reply of the Colonel, which naturally I made out for him, was to the effect that, inasmuch as the senior Subaltern of the regiment lived about 40 miles from the vacant troop, it would be no use appointing him to the command, and therefore the promotion was respectfully put forward on the ground of troop interest, troop qualification, and local influence. I will touch upon one thing incidentally with regard to the horses. I think a great deal more might be done in Yeomanry regiments with regard to raising the class of horses used, which would be beneficial to the regiments themselves and to the service of cavalry, and, I think, might indirectly affect our supply of troopers to the Regular cavalry. When I joined the Staffordshire we were riding horses some of them 16½ hands and some 14'3, greys and piebalds, and some horses for funeral purposes, with their tails tied up in a big lob. We had a most extraordinary mixture of horseflesh. I thought this must be got rid of, so I asked the Colonel's leave to start an insurance society in the regiment. Every man paid down 5s. entrance, and 2s. 6d. a year from his permanent duty pay, which was stopped, and the Officers gave a handsome donation from their own funds. We put down the qualification that no horse under 15 hands 1 inch, and no horse that was not practically sound, and no horse that was of grey colour, should come upon the insurance. We gave the man whose horse got sick during the week 3s. 6d. a day, and if he lost it we paid him the price; and if a man fell ill owing to accident he was paid 3s. 6d. a day and the doctor's bill was paid. There was a troop committee of Officers, the Quartermaster, a Surgeon, or a Veterinary in each case. The result was that in one year we got rid of all undersized horses and all grey horses. When the Duke of Cambridge came down to see us there was not a horse on parade under 15 hands 1 inch high, nor a single grey horse in the regiment. With regard to the work done, I do think that, considering what the Yeoman of an average of about 25 years gets through and learns in the short time at his disposal, it gives us, in spite of Colonel Lonsdale Hale's remarks, every reason to hope that if they were employed as the Staffordshire were for six weeks at one particular time in 1842, for six or eight weeks, and were working with Regular cavalry, they would be able to give very good account of themselves indeed. I am quite convinced in my own mind that they can be got up to a pitch of enthusiasm about the Service if they are properly handled. It is necessary that they should know their Officers, that their Officers should be present at all troop drills, and the Adjutant also. The Officers must not be too proud to sit down at luncheon with the troopers and talk with them afterwards. I always insisted that every Officer should be present at the luncheon. I was there myself, and I explained little matters to them after lunch was over, and got to know them all. During the last three years of my service I had 77, 107, and 177 recruits. It can be done, I am sure, if there is personal influence brought to bear upon them. There is one point I should like to touch upon before sitting down, and it is this. I do not think that the system of inspectorship as laid down by the lecturer would be quite workable, and I do not think it would be a fair system. He has named York, Norwich, and Hounslow as three regimental districts to be handed over *in perpetuo* to the command of retired Colonels of cavalry. That, I think, would be very hard lines upon the territorial regiments, and I do not think it would work fairly. I think the Officers in the double battalion of the Norfolk Regiment, for instance, would think it very hard that they should be for ever shut out from the command of their own regimental districts when they had done good work as Com-

manding Officers. Is there any alternative which might meet the case? I think there is, and a much simpler one. We have one Inspector fortunately left to us in the Northern District. What, then, can be done with regard to the Southern District? I think this. Our Inspector-General of Cavalry has a Brigade-Major, and that is all his Officers' Staff. It is a sort of semi-shelving. It is a high and influential position, and almost one of the chief positions now in our Army. To get that Inspectorship of Cavalry, I believe, a Major-General's command was reduced to a Colonel on the Staff's command. An Inspector of Yeomanry was done away with, so that, reading between the lines, it was altogether a Treasury matter. The matter of efficiency and the matter of prestige as to the appointment I do not think was considered for one moment. I think, with all due respect, that it would be a very useful thing to give the Inspector-General of Cavalry, not the junior Officer as Brigade-Major, but an Assistant Adjutant-General for Cavalry, who would combine with his work the work of Inspector of Yeomanry Cavalry in the Southern District. The Inspector-General could then go about his work inspecting cavalry regiments and doing the office work in London, while he could depute the Assistant Adjutant-General and Inspector combined to go down and inspect such regiments as the gallant Officer is to-day inspecting—the North Devon Regiment, who will turn out about 160 or 170 men strong. Some of the regiments which he will inspect will turn out something under 100. It is work for the Colonel and not work for the Inspector-General in a high position. I think that might be a very easily applied alternative to the one Colonel Crichton has put forward to-day. With regard to juries, I may say that that question has come up before. It was suggested by myself years ago; and the answer was given that in some of the smaller counties, if the Yeomanry were struck off the jury panel, there would be no jurymen at all; and that women would have to be employed. I think the question might be put in this way, and which has incidentally been referred to in the lecture, that they might be put at the bottom of the jury panel, and that whenever any civilian was available to do duty, he should be employed first. I think, further, that the wheel tax might be removed from the two-wheel carriages which Yeomen, as a rule, use, and, failing his possession of such a carriage, he might, I think, be allowed to use a gun free from the 10s. tax, which was equivalent to the horse tax which was charged years ago. Few people have gone into the question, outside the circle of Yeomanry Cavalry, as to the actual cost to Officer and man of the Service. I went into it very carefully during my five years. There are Yeomanry Officers here who can correct me if I am wrong in what I state. I calculated that a troop Officer paid at least 100*l.* a year out of his own pocket for the maintenance of his own troop—refreshments at drills, and giving prizes for shooting, swordsmanship, and all sorts of things. I obtained information from the bankers at Lichfield to the effect that, on an average, the men spent between 30*s.* and 3*l.* over and above what they received from the Government during their time of permanent duty. We were a strong regiment, and there were a good many large farmers and well-to-do men in it. I think, considering what the Yeomanry themselves spend over and above their pay, and considering how the Officers have laboured in the past, and, I believe, still labour, under adverse circumstances, owing to the depression of agriculture and a large number of farms remaining on hand, and so on—I think, considering what they have borne and suffered in the way of keeping up a force which the Government ought to maintain, they deserve our sympathy and support, and ought rather to be encouraged than to be snubbed in the way they have been by a great many people, both in the Press and in Parliament, who know nothing about the subject whatever.¹

¹ The limited time at my disposal during the discussion did not permit of my touching upon the utilitarian part of the subject involved in the word "Future" in the heading of the lecture. The present terms of engagement for Auxiliary cavalry limit the use of this branch to the United Kingdom. No doubt, in times of national crisis, many would volunteer for service abroad. "Defence, not defiance" and "Pro aris et focis" being the mottoes of many regiments, we may ask then what is their function, what could they do, and what is their place in case of an invasion?

Major BICKERSTETH (Middlesex Yeomanry) : Before Colonel Crichton sums up, perhaps I may be allowed to make one or two observations on some minor points in his lecture. I do not intend to go into the question of the utility of the Yeomanry. Colonel Lonsdale Hale has told us that he has a very strong coat, and however temptingly he has trailed it before us, I have no intention of treading upon it. But, speaking I am sure for a great number of my brother Officers in the Yeomanry, I may be allowed to say that we all must feel extremely grateful to Colonel Crichton not only for the very interesting lecture he has given us, but for the testimony which he, as a distinguished cavalry Officer, bears to what we may accomplish in our efforts, imperfect though they are, to emulate our comrades of the Regular cavalry. Leaving, then, on one side the theory question raised by Colonel Hale, I will confine myself to one or two observations on some of the points touched upon in that part of the lecture which relates to organization. I entirely agree with what the lecturer has said about the training at the school at Aldershot. He says: "I cannot say that I think the training at the School is altogether satisfactory as far as the Officers are concerned; they get the theory and not the practice of the work, and, from leading nothing but skeleton ranks, they are quite at sea when placed in front of a troop or squadron." With this sentence I fully concur. I think it most desirable that Yeomanry Officers should have an opportunity not only of learning the theory of cavalry work at the school, but of actual practice, which they can only have by being attached to Regular regiments, whether in the districts where they reside, or at Aldershot, or elsewhere. In this matter I can speak from experience. I had the honour of being attached for several summers in succession to the Carabiniers, and thus had an opportunity of instruction and practice not only in the field but in the ordinary work of a cavalry regiment, such as stable work and the interior economy of the regiment, all of which cannot fail to be useful, although it is obvious that opportunities for instruction and practice of this character cannot be looked for at the school at Aldershot. Another point that struck me was Colonel Crichton's suggestion that it might be very useful if the words "and Ireland" were added to Great Britain in the National Defence Act (1888), so far as it relates to the liability of Yeomen to military service. I cordially subscribe to that. In the first Yeomanry regiment to which I belonged (the Sherwood Rangers), the form of attestation was for service in the United Kingdom. Whether we could have been legally called on for service in Ireland or not I do not know; but we were certainly sworn in to serve in the whole of the United Kingdom and not in Great Britain alone. The next

The answers to these questions involve some important questions of strategy and grand tactics. At present there is no place allotted to Auxiliary cavalry in the scheme of mobilization. If there were an invasion, involving a landing on some points of the south coast only, it would be a difficult matter to utilize the Regular cavalry at our disposal, and all idea of using cavalry in large masses would have to be abandoned; in fact, no cavalry General would be likely to have more than a brigade under his immediate control. If a landing were attempted on the south and east coasts at the same time, there would be more scope for use of cavalry, but of course subservient to the general features of the country. The Auxiliary cavalry then could be used as divisional cavalry, as escorts to convoys, and as reserve cavalry, also on the lines of communication, and thus free a proportionate number of Regular cavalry for work in front and on the field of battle. Further, in the event of initial success on the part of invaders, certain of our large industrial centres would probably require watching, in view of possible trouble arising from action of the unemployed masses; the Auxiliary cavalry would be quite competent to deal effectively in such crises. For the small sum expended we have some 11,000 of all ranks, in the prime of life, who, for the opportunities at their command, give, even now, a fair return for the money in the way of duty performed and efficiency. They certainly require increased encouragement in, and facilities for, shooting; they may require modification in organization and constitution, but I am convinced that to disband them would create incalculable discontent among a class who serve their country to the best of their ability, at great personal inconvenience and personal expense.—F. G.

point which struck me has already been alluded to by Colonel Graves, who has pointed out one difficulty in the way of granting to the Yeomanry the privilege of exemption from service on juries. If this exemption could be granted, I think it would be a most excellent thing. Yeomen have often told me how much they would appreciate this privilege; and Yeomen as a rule belong exactly to that class who do value a privilege of that kind, or the other which has been suggested, viz., exemption from the tax on two-wheeled vehicles, and value it too for its own sake, apart from the relief afforded in time or money. I think something of this kind would go far to repair the mischief which, fanciful as it may seem, was undoubtedly done to the Yeomanry by the abolition of the horse tax. Passing to the next page of the lecture, I entirely agree with Colonel Crichton that the present requirements are ridiculously small, and that if the grant were increased, as we should all like it to be, the requirements might be largely increased too. I think there would be no difficulty at all, as far as my experience goes, in finding Yeomen quite willing to go out for fourteen days' training, instead of the six or eight or ten days we have now, on the understanding that they could get leave for two or perhaps three days during the training. I have been told very often by men, not so much in the regiment to which I belong now as in the Nottinghamshire Regiment in which I formerly served, that they dislike particularly the necessity of being away from their farms for eight consecutive days without a chance of returning to them. In the Sherwood Rangers we had, and I suppose this is the case with most Yeomanry regiments, a large proportion of farmers and other employers of labour. They said they would willingly come out for fourteen days if they thought that on two out of those fourteen days they might be able to go back to their farming or other business, and see how things were going on, and that their visits should be unexpected by the people working there. I do not think there would be the least difficulty, as far as Yeomen are concerned, in lengthening the period of training to fourteen days on the understanding that every man could have at least two days' leave during that time. I do not wish to go into the question that Colonel Crichton raises about squadron organization. However well it may work in the case of a Regular regiment permanently quartered in barracks, I think the proposal to extend it to Yeomanry regiments would require a good deal of consideration. My own idea, so far as I have considered the matter at present, would certainly be against a proposition to abolish the present organization of troops. Nor do I quite agree that a squadron of forty-eight front in the Yeomanry would be likely to work well. I should prefer myself to see a squadron of thirty-two files. I think that a Yeomanry squadron with that frontage is likely to work much better than with the larger frontage advocated by Colonel Crichton. I quite agree with Colonel Crichton's remarks on the importance of the shooting in the Yeomanry; but if the musketry is to be carried out during the permanent duty it is absolutely necessary that the period of training should be prolonged. It would be quite impossible with the present limited period of permanent duty to carry out the musketry during the training. The great difficulty in getting the musketry properly done in London is that it is extremely inconvenient for the men; the only possible range is most awkwardly situated, and is not only at a considerable distance from our headquarters, but is only available for a limited number of days in the season. The last point to which I wish to refer is Colonel Crichton's very important suggestion about troop riding schools. We have been extremely fortunate in London. Thanks to the permission of the successive Officers who have commanded at Hounslow, with the sanction of His Royal Highness, our men have had week by week during the winter months regular riding drill in the Hounslow Barracks on the troop horses of the regiments that have been quartered there. During the winter before our last inspection we were thus able to pass through the riding school 120 men, and there is not the least doubt that the system has been of the greatest value and importance to us. As Colonel Crichton is probably aware, we have a detachment at Brighton; and they have also had the use of the riding school in Preston Barracks in a similar way. No one who has seen the regiment inspected both before and since the commencement of this system can have failed to be struck by the marked advantage which the men have derived from regular instruction in

military riding; and where regiments have not the same facilities which we enjoy in connection with Regular cavalry barracks, I am sure Commanding Officers would find the benefit of adopting Colonel Crichton's recommendation for the establishment of troop riding schools. Before I resume my seat I should like to say once more how sincerely grateful I think Yeomanry Officers ought to be to Colonel Crichton for giving us so interesting a lecture.

The CHAIRMAN: I am sure we must all echo what has fallen from the last speaker. We are very much obliged to Colonel Crichton for the interesting lecture which he has given us. He speaks to us not only as a Yeomanry Officer of experience, but also with great weight as having been Adjutant of the 10th Hussars, and having held appointments on the Staff, which singularly fit him to look at this question from an all-round point of view. I think he has had perhaps a rather hard critic in Colonel Lonsdale Hale, but I am sure he will join with me in being glad to hear not only the other side, but the very worst of the other side. Before we hear Colonel Crichton's reply, I should like to make one or two remarks upon some points in his lecture. I quite agree with what Colonel Graves said as to the impossibility of York, Norwich, and Hounslow being permanently handed over to cavalry Officers, because it would operate unfairly on the Officers of the Royal Fusiliers and Norfolk Regiments; but we have utilized Colonels of regimental districts who are cavalry Officers for the inspection of Yeomanry regiments. I strongly agree with what has fallen from Colonel Crichton that it is most desirable that we should have the same Officer to inspect year by year. I have always felt that very strongly myself. With regard to the jury question, I may say that it has constantly cropped up, and that we have been most anxious, in consequence of the dearth of Volunteer Officers, at least to exempt Officers of Volunteers from serving on juries; but we are met with the greatest possible difficulties from those departments of the State which are responsible, and I am afraid there would be great difficulty in getting any exemptions made, on account of the jealousy caused by such exemptions. With regard to the varying establishments that Colonel Crichton has pointed out, it seems very absurd; but, looking at it from my point of view, we cannot help it. We are obliged to take the men where we can get them. It is very difficult to lay down any organization that will suit all districts, and practically, although we try every now and then to improve the organization by diminishing in one place and increasing in another, we have much difficulty, not only with the Yeomanry, but even with the Militia, to get the battalions of the same size and the organization exactly as we should like. Then with regard to decreasing the permanent sergeants. Colonel Crichton allows one sergeant for a squadron instead of a troop. That is a subject which was gone into very carefully two or three years ago, and Lord Harris, who is very well known in connection with the Yeomanry, and who was Under-Secretary of State at the time, was in favour of it; but it met with the greatest possible opposition from nearly all the Yeomanry Commanding Officers. The only other question I should like to refer to is this. We are aware that all wars, and particularly an invasion of this country, will come very suddenly indeed—as quick as lightning, and almost without a declaration of war. In order to prepare for the enemy, we have been obliged to go most carefully into what is to be done with every Officer and soldier, not only of the Army, but of the Militia and Volunteers. Everything has been arranged as to where each man is to go in case of an invasion. It is all done by a Committee of the War Office, called the Mobilization Committee. I am not on that Committee, and I do not know what passes there, but I have reason to believe that in consequence of our country being a very peculiar one, and very much enclosed, their opinion, and the opinion of others, is that it is very difficult to find a *rôle* for any large body of cavalry for the defence of this country. They have had, therefore, some difficulty in selecting a place for the Yeomanry for warfare in England. Of course, if the Yeomanry could be armed with a long rifle and take more trouble with musketry, there is not the slightest doubt that not only the Mobilization Committee, but other people, would think their value might be enormously increased. But I know there is the greatest difficulty in the Yeomanry to do anything whatever to lessen their cavalry appearance, which they value very much. They like the uniform and swords and the charging—there is not the slightest doubt about it. I am told on all hands that any attempt to turn them

(not into mounted infantry but) even into mounted rifles would be received with much discontent, and very likely abolish the whole Force. That is what I am told. I think it would be very difficult for any Secretary of State for War to go to the country to ask for more money for the Yeomanry under its present organization. I ought to say that that is my own personal opinion, though not an opinion I am entitled to give from the Office. That more money is wanted for the Yeomanry there is no doubt. Great difficulty has arisen in many corps from want of money. I hope you will understand the great sympathy I have for the Yeomanry, and it is remarkable to see regiment after regiment, under the great difficulties they are in at present, turn out as smart as they do. I have heard cavalry Officers say that they cannot understand how, with so short a training, they can arrive at such a pitch of efficiency. I will now ask Colonel Crichton to reply to the observations which have been made. I am sure we all thank him very much for his very interesting lecture.

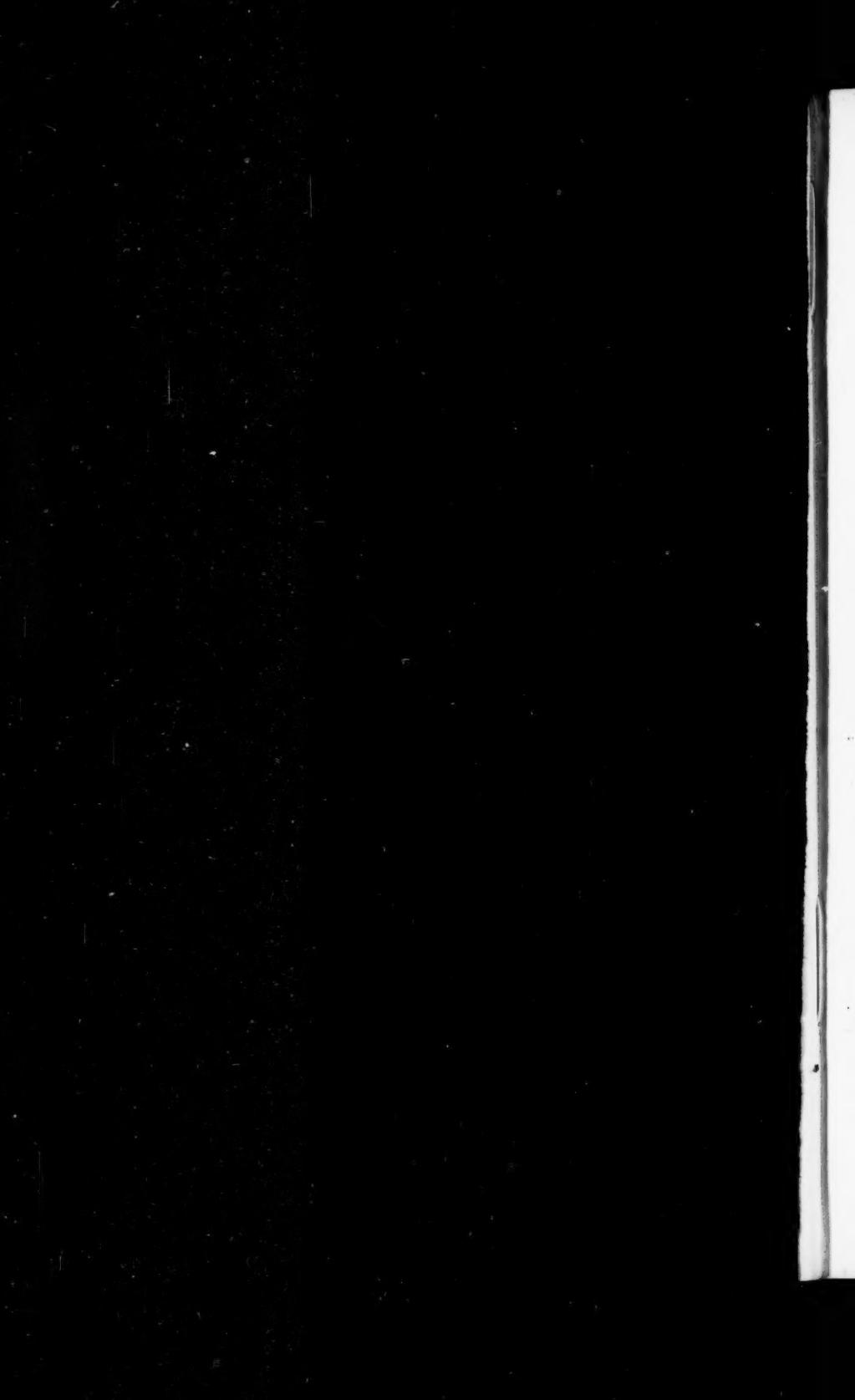
Lieutenant H. H. GETHEN (4th V.B. The Queen's Royal West Surrey): I agree with Colonel Hutton, that every Volunteer battalion should have twenty-five mounted men to act as scouts. As mounted infantry becomes more known, with very little encouragement there will not be much difficulty about raising those twenty-five men; therefore, the Volunteer battalions will be, to a great extent, independent of the Yeomanry as mere scouts. Our corps had permission to form a mounted detachment last June. I have recruited nearly every man myself, and have now twenty-four men, so that the detachment is almost complete, and by the time of inspection probably the number will be made up. Every man can ride and shoot. They have nearly all fired their class for this year, and the type of men that I get are of the type that joined the Volunteers twenty-five years ago; they are a better class than are joining the ranks in many Volunteer corps now. The 4th West Surrey is principally a working-men's corps, but this detachment is made up of men in a good position, some of them keeping their own horses.

The CHAIRMAN: I do not see what this has to do with the Yeomanry question.

Lieutenant GETHEN: My argument is that if each Volunteer regiment has its mounted detachment, it is not necessary to interfere with the Yeomanry. Let them continue to act as auxiliary cavalry working in combination with mounted infantry, but if Yeomanry should be converted into mounted rifles we should be worse off for cavalry than we are at present.

Colonel CRICHTON (in reply) said: I have not much more to say, as my lecture has been a very long one. Colonel Lonsdale Hale, in his remarks, was rather down upon the cavalry, the Yeomanry, and myself. The first thing he said that I was wrong in doing, was in giving too much time to the organization of the Yeomanry, and not enough to its "future utility." I did not choose the title of the lecture. I was asked by the Institution whether I would give a lecture on "The Yeomanry and its Future Utility." If Colonel Lonsdale Hale had been asked to give that lecture, I expect he would have given nothing at all as to its future utility—he would not have given even as much as I have done. What I found in preparing the lecture was that the organization was bad. How could I go on to its utility without reconstructing the organization according to what I thought was right? I therefore took up a great deal of time in reconstructing the organization, and first of all I took up a page or two with the history of the past utility of the service. To prove that its future utility would be of any service, I had to prove its past utility. Colonel Lonsdale Hale said that it was quite impossible for the Yeomanry to be of any use in charging, with the short time for training they get. The supposition I made was that our forces abroad had been beaten, and that the tide of war was then turned upon our shores. In the meantime, the Yeomanry would have been under training for weeks or months; and I maintain that Yeomanry regiment which has been under training for weeks or months would equal any cavalry in France, or in Germany, or any other place. Colonel Lonsdale Hale said, "What good would they be after 14 days' training against foreign cavalry?" I say they would have had 14 weeks or perhaps 14 months' training, and then they will be of very great good against a foreign cavalry. As to scouting—the little incident I referred to about the Volunteer Review at Portsmouth—Colonel Lonsdale Hale said it was the Umpire who had prevented the

enemy from finding out what force we had. I say it was not the Umpire. I say it was the Yeomanry Cavalry that prevented the enemy from finding it out. Colonel Lonsdale Hale said, "Why should we not learn dismounted duty?" We do learn dismounted duty; and if Colonel Lonsdale Hale will come down and see our inspection on the 19th May, I shall only be only too delighted to show him what we can do in that direction, because, rightly or wrongly, we pride ourselves a good deal upon it. Colonel Lonsdale Hale also referred to the services which Colonel Baker had performed in the Manoeuvres of 1870-71. I can only say that I always tried to follow that Officer to the best of my ability. Now regarding what Colonel Graves said about His Royal Highness inspecting regiments, I may say that I believe that that has done a great deal of good to the Yeomanry. Yeomanry are always proud to see any of the Royal family come down to inspect them. His Royal Highness inspected us at one time, and I hope he will do so again. Colonel Graves mentioned that I might have said more upon some subjects. My difficulty was not to say too much upon the subject of Yeomanry, so keenly do I feel for it. He said something about the personal influence of the Officers. I know that is of great moment. He told us that in his regiment the Officers lunched with the men. I have no doubt that all regiments do the same thing. He likewise said that command ought to be by selection for troops and regiments. It is by selection in my regiment, at all events; and in most regiments I believe it is so too. You have not only to select a good Officer, but to select an Officer who lives in the district where the troop is. Then as to inspections by the Officers commanding regimental districts, I quite agree with what Colonel Graves found fault with in my system, as to a cavalry Officer being always appointed to certain districts. It would be very hard on infantry Officers belonging to regimental districts; but at the same time I think there ought to be three Inspectors instead of two. There is too much work for two Inspectors; there are so many regiments out at the same time, that one Inspector could not do the work, and so I think it ought to be divided up into three districts. But a cavalry Officer need not always be given command in one particular place. You might have one cavalry Officer always in the Northern District, the Central District, or the Southern District, which would do equally as well. It is not necessary that he should be stationed where the cavalry regiment is. As to an Assistant Adjutant-General, which Colonel Graves suggested, doing part of the Inspector's work, I must say that I do not like that system at all. I think his place is at his office. If he is to go about for a great part of his time inspecting regiments, he would be very much behindhand in his work. I was expecting some one to say that they did not like squadron organization, and therefore Major Bickersteth's remarks did not surprise me. I think it is a system that grows upon Officers. I know most of our cavalry Officers are anxious for squadron organization, and I believe it would be beneficial to Yeomanry as well. What you, Sir, said about reducing permanent sergeants is quite true, viz., that it would be a very unpopular thing. I was one of those Officers whom you mentioned, who were against it, and I only advocate it now if you give pay to the Yeomanry sergeants in their place. Yeomanry sergeants would be much cheaper than permanent sergeants, and I think they would do the duty just as well, if not better. I have a great many in my own regiment perfectly competent to do the work, and they are much better recruiters than permanent sergeants, and paying them 10s. for every efficient man would make them keen in keeping up the strength of their divisions much better than the troops are now kept up. With regard to the establishments, you, Sir, mentioned that you thought you ought to have different establishments, because you must get the men where you can. Those establishments are never kept up, or anything like it. The strengths vary almost as much as the establishments do, so that I really think it would be much better to fix two new establishments, say, 200 or 300, and you would be more likely to keep up those establishments. Of course the great saving that you would get would be if you asked for greater efficiency from the Yeomanry. You would get fewer, but what you got would be worth having.



FOREIGN SECTION.

THIS portion of the Number, hitherto the Occasional Notes, has now become the Foreign Section, and is reserved for articles, either original or compiled, on professional subjects connected with Foreign Naval and Military matters; also for notices of Professional Books, either Foreign or English.

The Council of the Institution wish that this section shall be developed still further, and I have undertaken to continue my Editorship during the current year, with a view of aiding them in carrying out this work. It seems to me possible to make this section, and consequently the Journal, the means of keeping our Members acquainted with all naval and military progress abroad *pari passu* with that progress; and I shall be glad to receive from members of both Services, including in the latter those of the Auxiliary Forces, suggestions, information, or offers of assistance.

It is desirable, further, that I should state that, as regards editing the Naval matter in the Section, I shall have the aid of Naval Officers, thoroughly competent to give good advice and to pronounce sound opinions.

It must, however, be borne in mind that, as the change from a quarterly to a monthly issue has been made in order to ensure the more prompt publication of the Lectures after their delivery than has hitherto been the case, the Foreign Section will, as a rule, be restricted in extent during the Lecture season in the first half of the year, and will be prominent in the second half.

It is requested that communications and books for review (the latter under cover to the Librarian) may be addressed to me at the Royal United Service Institution, Whitehall Yard, London, S.W.

LONSDALE HALE,
Colonel R.E. ret.

THE RUSSIAN NAVAL MANOEUVRES OF 1890.

Translated by permission from the "Marine-Rundschau," November, 1890, by Commander H. GARBETT, R.N.

THE Russian naval manœuvres of last year took place between the 25th and 30th of August; the leading idea of the operations was as follows:—A hostile squadron had obtained command of the Baltic and the Gulf of Riga, and occupied the Moon Sound, which the enemy used as a base from which to blockade the Gulf of Finland and destroy the seaborne trade, while at the same time inflicting as much damage as possible on the seaports from Sweaborg to Bjorkö. On learning that some of the defending ships are in Sweaborg, a division of the hostile fleet is sent to blockade that harbour, while the remainder proceed eastward to carry out the designs against the Finnish coast. The defending fleet protects the principal trading ports from Sweaborg to Bjorkö, and takes advantage of the separation of the hostile ships to attack the different divisions and single vessels. Finally, the defending Commander breaks out of Sweaborg and the different fiords with his fleet, and, proceeding to the Moon Sound, threatens the communications of the enemy with his base; his end and aim being to concentrate his forces by a general movement in rear of the enemy off Sweaborg.

Special attention was also to be paid during the manœuvres to testing the private signals for distinguishing friend from foe, and the determining of the zone within which torpedo-boats of the 1st and 2nd class could be trusted to operate independently.

The attacking squadron was under the command of Vice-Admiral Kopytow, with Rear-Admiral Giers as his second-in-command, and consisted of the following ships:—

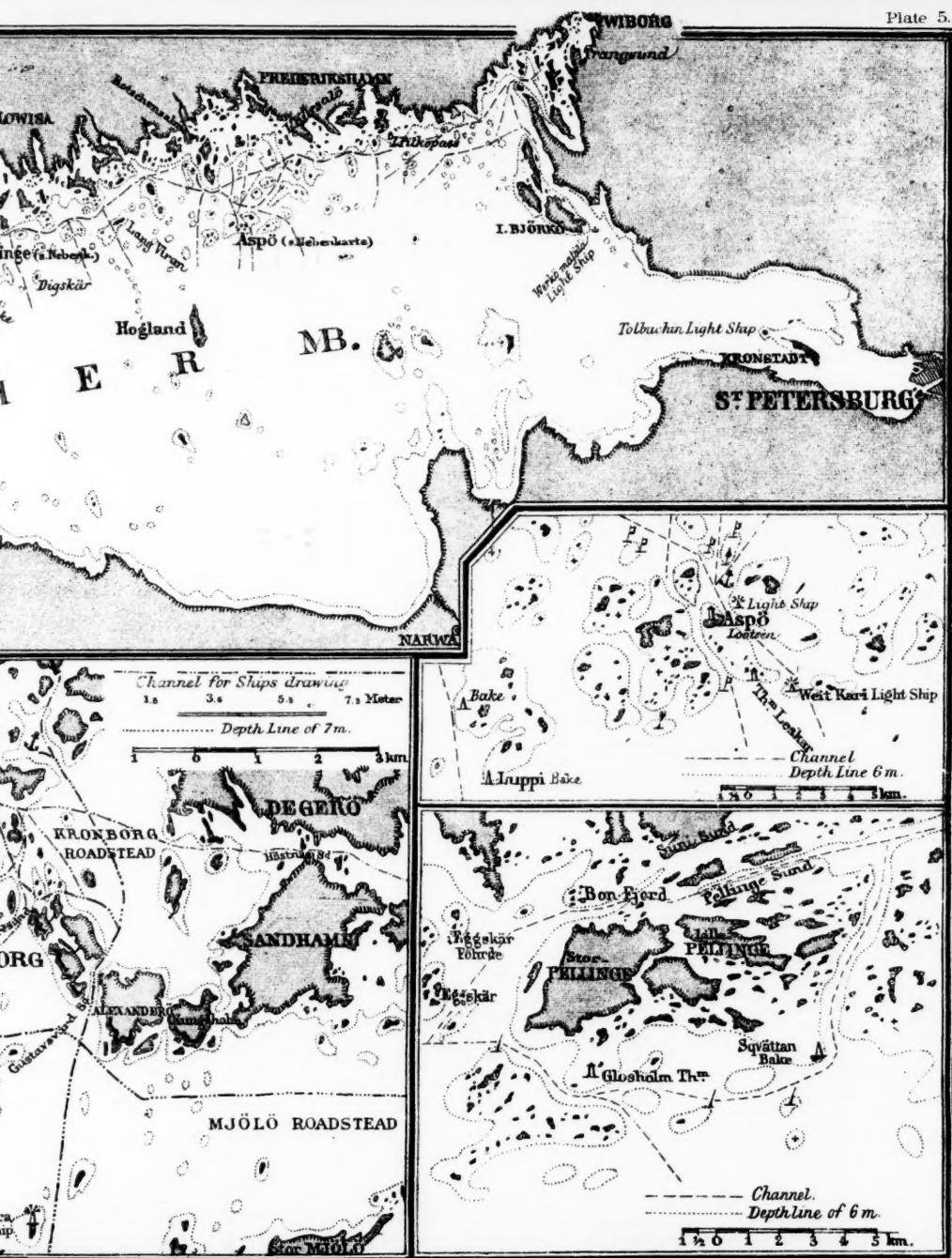
	Displacement.	Speed.
The ironclad "Peter Weliki".....	8,749	14
" " "Admiral Greig"	3,593	10
" " "Admiral Lazarew" ...	3,556	10
" " "Admiral Spiridow" ...	3,740	10·5
Corvette "Rynda"	2,950	15
Clipper "Strelok"	1,343	11·5
" " "Wjastnik"	1,256	13·5
Torpedo-cruizer "Lieutenant Iljin" ..	595	18

The 1st class torpedo-boats "Kotlin," "Luga," "Windava," and "Sweaborg"; the transports "Krasnoja Gorka" and "Artjelschitschik," and the schooner "Samojed." The transports and schooner were detailed to keep the squadron supplied with coals and provisions.



SCENE OF THE
RUSSIAN NAVAL MANŒUVRES,
1890.







The defending squadron was under the command of Rear-Admiral Gerken, and comprised the following ships:—

	Tonnage.	Speed.
The ironclad "Admiral Tschitschagow" ..	3,511	10·5
Armoured gunboat "Tscharodeika"	2,020	8·5
" Smertsch"	1,520	8
The clipper "Opritschnik"	1,426	13
" Plastun"	1,256	12

The gunboats "Snjeg," "Groja," "Doschd," "Barja," and "Wichr"; the 1st class torpedo-boats "Lachta," "Narwa," "Libawa," "Wyborg"; light 2nd class torpedo-boats 23 to 30; the transport "Ilmen," and the schooner "Slawjanka."

Although the leading idea of the operations was to be complied with, yet a completely free hand in taking the initiative and in carrying out their instructions was left to the respective Commanders. The attacking fleet was ordered to assemble in the Moon Sound on the 24th of August; one portion of the defending force was to be at Sweaborg on the same day, the other to be in the fiords to the eastward. The entrances from the sea to the different fiords and the channel up to Sweaborg were considered as barred by mine-fields, in addition to which the mine-field at Rotschensalm in the channel leading to the Little Pellinge and Trangsund were supposed to be also defended by light artillery. Reval, Porkala-Udd, and Hangö-Udd were also considered as fortified and protected by mines, so that these roadsteads remained closed to the enemy. It was further contemplated that a portion of the hostile fleet should be stationed off the Tolbuchin Lightship and blockade Kronstadt, so that the route to the fortress behind the meridian of Werkömatala was barred to the defenders. The enemy was forbidden to obtain news by telegraphic despatches, and was to trust entirely to the observations of his own ships for news of the movements of the defenders. The defending force, on the contrary, could learn all the movements of the enemy by the land telegraphs and the signal stations erected on the coast. The supplying of the ships of the attacking force with coals and provisions was to be carried out from the Moon Sound by the transports already mentioned. In the sorties of the ships and torpedo-boats of the defenders from the different fiords from midnight of the 26th to the 27th of August, all merchant ships which were met, and whose names were ascertained and entered in the log-book, were to be considered as ships of the enemy captured while conveying stores, &c., for the fleet of the latter. It was a condition, however, that the ships and vessels which took part in the sortie should not be destroyed or captured by the enemy, as in that case the prizes were also lost. If mines were laid anywhere by the enemy, in order to prevent the breaking out of the defending ships, the vessels engaged in laying the mines were to remain on the spot out of range, unobserved sufficiently long to lay the necessary number of mines to form a barrier, and in laying down the mines only that number could be

counted which were actually carried on board the ships of the squadrons. There were one Umpire-in-Chief and two Umpires, each of whom was assisted by two Staff Officers. The commanding Admirals were directed to communicate confidentially their plans to the Umpire-in-Chief.

On the 21st of August, the steamer "Onega" proceeded to Trangsund with the Umpires, where the Umpire-in-Chief, Vice-Admiral Kasnakow, made himself acquainted with the plans of Rear-Admiral Gerken, commanding the defending fleet; from there he went to Helsingfors, and, embarking on the 22nd of August on board the gunboat "Grosjaschtschi," proceeded to Moonsund, in order to learn the plans of Vice-Admiral Kopytow, the Commander of the enemy's squadron; he then returned to Helsingfors.

The hostile squadron on the 23rd of August put to sea from Reval. On the morning of the 25th, Rear-Admiral Giers was sent with the 2nd division to the Moon Sound. This division consisted of the "Rynda" (flag-ship), "Wjastnik," "Admiral Lazarew," "Krasnaja Gorka" and "Samojed." The 1st division, under the command of Vice-Admiral Kopytow, comprising the "Peter Weliki" (flag-ship), "Admiral Spiridow," "Admiral Greig," "Strelok," "Lieutenant Iljin," and the "Artjelpchitschik," remained at sea and cruized in sight of the lighthouses from Packerort and Adensholm, as well as of the Moon Sound Channel. At 8 A.M., the clipper "Strelok" was sent to the Moon Sound to fetch the Umpires allotted to the attacking force; she rejoined during the night with the "Krasnaja Gorka." The torpedo-boat "Windawa" served as despatch vessel between the divisions.

The defending squadron had left Trangsund on the 23rd of August, and had steamed to Helsingfors. Single vessels were stationed *en route* at certain points of the coast to watch the sea. In addition, mine-barriers were laid down at fourteen points between Trangsund and Helsingfors, some of which were under the protection of batteries. Six secret coaling depôts for the torpedo-boats were also arranged. At daybreak, the torpedo-boats "Lachta" and "Libawa" were sent to sea to scout; they returned, having been unobserved by the enemy, and reported the approach of three hostile ships. At 3 P.M., these were made out from the land to be the "Rynda," one of the turret-ships of the Admiral class, and the "Lieutenant Iljin"; the three ships remained in sight until midnight, but always out of range. The defending Commander concluded from the movements of the three ships that they were intended to cover the route to the Moon Sound, so information was sent to the observation stations to the east of the probable movements of the enemy. The next morning it was reported that one of the enemy's transports had passed the meridian of Kalboden Ground, steering east.

On the morning of the 26th of August, Admiral Kopytow sent the "Strelok" and the "Iljin" to scout towards the land, as, there being only a light breeze and the weather fine, an attack was expected, the other ships of the first division remaining at sea in sight of the lighthouse at Porkala-Udd. The defending Commander,

on his side, thinking that the bulk of the enemy's force was to the eastward of Helsingfors, sent the "Lachta" to reconnoitre as far as the Aspö Fiords.

From the signal station, one of the enemy's ships, the "Strelak," was reported in sight from Sweaborg bearing about S.W., but she remained so far out that the torpedo-boat "Libawa," which had been sent to reconnoitre, could not discover her, and at mid-day she was no longer to be seen from the land. The "Iljin" then hove in sight from the southward, and rapidly approached; she passed the Grähara Lighthouse, turned to the east in the channel between the reefs, and remained stopped some ten minutes. As Sweaborg is a strong fortress armed with the heaviest guns, the "Iljin" should have been considered as placed out of action, and, according to the manœuvre regulations, have abstained from hostilities for twelve hours. No Umpire appears, however, to have given judgment. In any case, the entrance of the cruiser with impunity showed that the defenders were too weak afloat, for had there been more torpedo-boats the "Iljin," even if she had passed the batteries without damage, would have been attacked simultaneously from the side of the Gustarsvärd Channel and from the eastern channel to the roadstead of Hästnäs Sound. The narrowness of the channel would have precluded a retreat. The turret-ship "Admiral Tschitschagow" was ordered out in chase, but something went wrong with her capstan, which delayed her weighing, so that when she arrived on the spot the cruiser had disappeared, and an ironclad and cruiser heaving in sight from the south-west, she put back into Sweaborg.

As we have already mentioned, the "Lachta" had been sent in the morning to scout as far as the Aspö Fiords for signs of the enemy, whose second division had in fact steamed to the east and attacked the anchorage at Aspö. The "Opritschnik," which was scouting, observed the enemy, and reported them at 11 A.M. The fiords were defended by the clippers "Opritschnik" and "Plastun," the gun-boats "Wichr" and "Slawjanka," the torpedo-boat "Narwa," and two 2nd class torpedo-boats, under the command of Captain Puschtschin, who weighed with his squadron and steamed as far as the Lipar Lighthouse, but remained behind the mine defences. As the enemy's squadron, which consisted of the "Rynda," "Admiral Lazarew," and the "Wjästnik," had not attacked at mid-day, the "Wichr," "Slawjanka," and "Narwa" returned to the inner fiords, while the clippers steamed to Kursalö. When the enemy observed that the "Opritschnik" had passed the narrow channel on the east side of the island Woiti-Kari, he concluded that it was free from mines, and determined to enter the roadstead with his ships and destroy his weaker foe. The channels here were, however, protected by mine-fields, which were not removed by the enemy before he entered, so his ships were later considered as having been placed out of action; Captain Puschtschin reported, at least, that two vessels could have been blown up. The enemy on their side claimed the victory, and asserted that when entering the roadstead the "Narva" and the 2nd class torpedo-boats would have been destroyed, and

that the "Wichr" had ceased firing. It appears that the "Narva" had discharged a torpedo both against the corvette and the turreted-ship, but without success. The manœuvre regulations laid down that if a ship passed over a hostile mine-field without having searched for the mines, she was to be considered as destroyed; if, however, a squadron was in line ahead, then in narrow waters only the leading ship, and in main channels the two leading ships, were to be considered as blown up. The assailants moved off to the east, and Captain Puschtschin to Bjorkö, while the "Wichr" and a torpedo-boat repaired the mine-barrier. The "Lachta" had also returned, having reported the fighting between the two divisions, but without having taken any part herself. In the evening came the report to Sweaborg that torpedo-boat No. 107 had succeeded in blowing up the "Krasnaja Gorka," one of the enemy's transports. The enemy had, therefore, already suffered serious losses, but the ships after twelve hours would again resume hostilities. In the evening the barometer fell, and the weather became dull, with rain and thunderstorms. On the 27th August bad weather set in, which lasted almost without interruption for two days, and the attacking force had rather a rough time of it. The ships remained at sea, blockading Sweaborg, but without seeing anything of their opponents. During the forenoon the weather was clear, but the wind rose; at mid-day it came on to blow hard, the wind veering from E.S.E. to S.W., with the force of the wind 10, while a heavy sea was running; in the evening the wind fell somewhat, the ships having lain to all day. The next morning the "Iljin" came in sight from Sweaborg, in consequence of the turreted-ship "Admiral Tschitschagow" and two torpedo-boats having put to sea to reconnoitre; the weather, however, was still hazy, and the ships put back to Sweaborg without sighting the enemy. The wind soon rose again, and the "Iljin" was observed from the land to have taken shelter behind the island Stor Mjolö. She must, therefore, have again passed over one of the mine-fields, and was for the second time put out of action. In the evening five, and then six, ships were observed steaming towards Sweaborg; later they altered course to the westward, but remained within sight of the fortress. The weather was now so bad that the enemy's torpedo-boats had to take shelter in Reval. The 2nd division of the enemy had been observed during the day off Pellinge; later on they presumably came to an anchor off the Kalboden Ground Lightship. Here the "Rynda" lost an anchor stock, and the "Admiral Lazarew," having run out of coals, had to be towed under shelter of the reefs by the "Krasnaja Gorka." In consequence of the heavy sea, while taking her in tow, the transport collided with the ironclad, losing one of her boats and smashing her bulwarks; finally, the towing hawser carried away and fouled her screw, so she had herself to be towed in by the "Wjästnik," while the "Admiral Lazarew" anchored and rode out the gale with 100 fathoms of chain, being eventually towed in early on the 28th by the "Rynda." On the evening of the 27th, all the ships of the defending squadrons were at their stations; the "Tscharodeika," "Smertsch," "Snjeg," and two torpedo-boats in Bjorkö, to protect

the coast line to Pitkopass ; the "Doschd," with one torpedo-boat, from Pitkopass to Kursalö ; the "Wichr" westward from Kursalö ; the "Grossa," with a torpedo-boat, from Digskar to Lang-Biran ; and the "Opritschnik," "Plastun," "Slawjanka," the "Narwa," and two 2nd class torpedo-boats, in Aspö. Off Söderskär lay the gunboat "Burja" with two torpedo-boats. Signal stations were also erected upon the heights of Sweaborg, and all the entrances to the roadstead protected by booms and other obstructions.

On the 28th of August the morning was dull and rainy, wind S.W., and barometer falling slowly. Two turret-ships and a clipper cruized before Sweaborg ; the other ships of the enemy watched the other portions of the coast of Finland. At daybreak two of the defending torpedo-boats, the "Libawa" and "Lachta," put to sea to try and destroy the enemy's transports coming from the west. The capture or destruction was, according to the orders, to be marked by the entry of the name of passing ships in the log. The "Ilmen" was sent to the east to scout, and a telegraphic order went to Björkö, that a clipper evading the blockading squadron should be sent to search the Moonsund, the base of the enemy, and to create a diversion in his rear, so that he might be moved to raise the blockade of the fortress. The remaining ships of the left flank of the defence were to come to Sweaborg.

Towards mid-day the weather became clear, and the attacking squadron approached the fortress. The turret-ship "Admiral Tschitschagow" left the harbour and steamed towards the "Peter Weliki," but did not go within range. In the afternoon it again came on to blow very hard, the force of the wind reaching 11. The ships in the roadstead of Sweaborg were compelled to let go a second anchor and get up steam. The "Lachta" lost her mast and drove, so that she was compelled to proceed to Narva-Hamn. The blockading ships had also to fight hard ; the flag-ship had two boats' davits carried away, and the boat hanging to them destroyed ; a six-oared boat was almost completely torn away, the pinnace disappeared completely, the steam cutter and another six-oared boat were damaged, and, in addition to other damage, an Officer and seaman were hurt. The "Admiral Greig" sprang a small leak in consequence of the bolts of one of the armour-plates slackening. With the exception of the two ships of the Admiral class, no other ships of the 1st division suffered any damage. The ships of the defending squadron rode it out without mishap, with the exception of the "Opritschnik," which lost all her anchors, and was compelled to put to sea under difficult circumstances. In the evening the weather got better, and the night was fine.

In the morning there had been a fight between torpedo-boats. The defending boats had, when they sought shelter in Borgö, found there the "Sweaborg" and "Luga," two of the enemy's boats, which had put in there for the night on account of the gale, and also a 2nd class boat, No. 60, which had been captured by them, it having been sent to Borgö with despatches. The "Sweaborg" and "Luga" immediately weighed and engaged the boats of the defending force, who had

to retreat and give up their prize. No. 60 brought despatches to the gunboat "Burja," and was then compelled to put into the Sunnisound, in order not again to fall into the hands of the enemy's torpedo-boats. During the gale the second division had been off the Kokschär Lighthouse, and had ridden the gale out without damage. Before the worst of the storm came on, the torpedo-cruiser "Lieutenant Iljin" had rescued twenty-two shipwrecked seamen from a boat, and conveyed them to Helsingfors.

On the 29th of August, the cruiser "Strellock," of the attacking force, approached Grähara, and was here attacked by the defending torpedo-boats; she, however, withdrew without damage. In the night, as we have already reported, the ships of the left wing of the defence had received orders to draw to the west and join the Admiral, and the clipper "Plastun," which was in Reval, was ordered to make a diversion from the south-west, so as to draw the enemy from before Sweaborg. There was a conviction that the ships coming to Sweaborg would come across the enemy on their way, because the hostile torpedo-boats had been found in Borgö, where they had made their way unobserved. In the morning the hostile squadron hove in sight of the fortress, and a clipper steamed within range of the guns. The turret-ship "Admiral Tschitschagow" and the "Libawa" steamed towards the enemy, the "Libawa" attacking the clipper, which had to retreat; the two ships then opened fire on the enemy at about 4,000 yards, but, failing to effect their object, at 1.30 P.M. they returned to the roadstead, the hostile squadron proceeding to Grähara, where the "Strelök" and "Luga" were blockading the other ships. From the "Luga" the Admiral learnt that the 2nd division during the gale had lain off Kotschär, and had afterwards proceeded to the northern side of the Gulf of Finland, where in the evening they were reported in the neighbourhood of Glosholm Lighthouse. The "Luga," under a flag of truce, proceeded to Sweaborg to report that the "Ilmen" had suffered damage during the gale; she had dragged her anchor and struck on a rock, and it was requested that one of the harbour steamers should be sent to her assistance.

On the 30th August, the last day of the manœuvres, the defending Admiral determined to attack the enemy simultaneously with all his ships. The arrangements were as follows:—The "Smertsch" and "Tscharodeika," with the torpedo-boats attached to them, should leave Björkö and Rotschensalm and join the squadron of Captain Puschtschin. The assembled force should then make for Sweaborg, and on the morning of the 30th should attack the enemy from Rönnskär. The orders which the cruiser "Plastun" had received have already been mentioned. The attack was to commence at 10 A.M., the torpedo-boats issuing from the Ugnsmun and Langörn Channel. The "ordre de bataille," formation for attack, private signals, &c., were communicated. Before, however, the Admiral with his ships had left Sweaborg, the "Libawa," which had been to Pellinge, reported that she had only been able to see the enemy's ships, and it must be therefore assumed that Fiörd flotilla was shut in by them. The dispositions were therefore changed. The turret-

ship "Admiral Tschitschagow" had already left the roadstead, and, although she sighted the enemy, she soon lost sight of them again in consequence of the thick weather; the ironclad wished, with the "Skobelev," which had been reconnoitring during the morning, to proceed to the eastward by the inner channel and assist the blockaded ships, but both ships had to give up the idea and return on account of the fog, and because the marks had been displaced and some destroyed by the late gale. About noon smoke was reported in the east, and the "Libawa" was again sent to scout in that direction, returning about 1 P.M. with the squadron of Captain Puschtschin and the "Plastun," which latter ship had joined him at Aspö, but without the gunboats "Smertch" and "Tscharodeika." Without these two vessels, an attack on the enemy was not feasible, and the Admiral therefore returned with his whole squadron to the roadstead of Sweaborg, to await there the expected attack from the enemy. In the interval the Grand Duke, the General-Admiral of the Fleet, had arrived on board pilot steamer "Glökön" to inspect the fleet. The enemy, however, remained in the neighbourhood of Grähara, in expectation of being attacked themselves by the defending force from Sweaborg. At 4.30 P.M. the 2nd division joined the 1st, and the whole steamed towards Sweaborg. The defending squadron weighed and stood out to attack, but darkness coming on they returned to the roadstead. The Fiörd flotilla had assembled in the morning at Bonfjord, and, having learnt that one of the enemy's turret-ships and a transport were lying at anchor off Egskär, it was determined to attack them. Arrived off Glosholm, it was discovered that the ironclad had gone; the transport, the "Krasnaja-Gorka," however, was captured by the "Opritschnik." At 7 P.M. the gunboat "Grosjaschtschi," with the Umpires on board, arrived in the roadstead and signalled that the manœuvres were over.

Possible combinations which might well occur in a war with a powerful enemy were kept in mind in drawing up the general idea of the manœuvres. But although the general idea and subsequent disposition left nothing more to be wished for, yet the forces placed at the disposal of both sides were far too small to allow them to carry out the parts allotted to them. The very unfavourable weather also was a great obstacle, and rendered the carrying out of an effective blockade not only very difficult, but almost impossible; neither could the strategical plans be fully carried out, so that a general air of indecision was given to the manœuvres. That the blockade should have been carried out as well as it was is a proof of the skill and endurance of the attacking force, and that the ships were commanded by capable seamen, and it also proves the seaworthiness of the vessels, for even in the Admiral class the only loss in the gale of the 28th August was in the six boats of the "Peter Weliki," and it may also be remarked that all the damage was caused by the weather alone; nothing went wrong with their engines or boilers.

The general idea of the manœuvres as far as they went was carried out. The defending force was blockaded in such a way that on the day they ought to have broken through it could not be done, as the

ships could not be collected for the purpose. The actions that took place were unimportant; on the other hand, the mines which were laid down proved a real protection, and showed that the clever disposition of mine-fields in waters suitable for the purpose would be of the highest importance, and if the enemy were not aware of their presence, or failed to remove them, he would suffer heavily. Although in this case the attacking force lost several ships by being blown up, yet their loss had no real influence on the course of the operations, as, in consequence of the small number of vessels employed, ships were considered out of action for twelve hours only, and all the less, as the defending Commander only learnt the decision of the Umpire too late to allow him to utilize his temporary advantage for breaking out of Sweaborg.

The ships were navigated skilfully, considering the difficult nature of the waters in which the field of operations lay. There were only three or four prizes taken, and these were made by ships of the defending squadron.

The Grand Duke Alexis, the General-Admiral of the Fleet, issued a memorandum at the end of the manœuvres, expressing his satisfaction with the efforts of the Officers and men, and conveying to the Flag Officers, Commanding Officers, Officers, and men his appreciation of the skill and zeal displayed by them. He specially calls attention to the skilful and bold handling of the "Opritschnik" by her Captain, when, her cables having parted in the height of a gale during the night, he took the ship out into the open sea, using his electric search light to find the channel through the breakers. This praise seems to have been well deserved.

NOTE.—A reference to the chart will show that along the northern coast, from Hangö up to Kronstadt, a succession of reefs, islands, &c., and fiôrds run the whole way, with deep-water channels between them and the mainland ; where the word fiôrd has been used in this translation it refers to the deep-water channels and anchorages within the barrier and islands, there being no English word which exactly expresses the word used in the original German for this particular coast formation.

NOTICES OF BOOKS.

Collingwood. By W. CLARK RUSSELL. London: Methuen and Co., 1891. Pp. 271.
Size 9" x 6" x 1 $\frac{1}{4}$ ". Weight under 1 lb. 14 ozs. Price 15s.

This is as pleasantly written and as valuable a piece of biography as one could wish to read. The picture blends together the traits of the stern professional man and of the human being with the deepest and warmest of affections. Mr. Russell brings well out the extent of the "ocean seclusion" of this great naval Commander and of the vast amount of work that Commander did away from the sphere of observation by the country generally. Lord Collingwood was a splendid type of that class of men before whose eyes stands the word "Duty" overshadowing all other considerations. Of Lady Collingwood, a real helpmate to him, Mr. Russell tells us much that is interesting. The part that women play as wives of great men is always worth studying, and is specially so in the days of the "judicial shock to marriage." At p. 171 are some amusing remarks in connection with naval Officers marrying. "Punch's" well-known advice with regard to matrimony finds some support here.

Rulers of India—Viscount Hardinge. By his son and private secretary, in India, CHARLES, VISCOUNT HARDINGE. Oxford: Clarendon Press. Pp. 196.
Size 8" x 5 $\frac{1}{2}$ " x 1". Weight under 14 ozs. Price 2s. 6d.

The authors of the previously issued volumes of this valuable series of works possessed one great advantage over the author of this one. The great work of the lives of the men whose biographies they undertook was, as a rule, ruling India, and that alone. But in the first Viscount Hardinge of Lahore we find a man who, besides ruling India for three years or thereabouts, filled high and important official positions in the service of his country for thirty years besides. It is difficult to form a right conception of a worker in a particular office without knowing a good deal about his work in other offices, so the writer of this volume has been forced to give a good many pages to the work Lord Hardinge did outside India. We own to having laid down the book rather exasperated when we had finished its perusal. That comparatively brief tenure of office in India covered a crisis of the severest kind in the history of our Indian Empire, and of that crisis the author knows so much more than he tells; what he tells us makes us wish for a great deal more from the same source. He lifts the curtain just high enough to show there is a great deal worth seeing yet behind it, and then suddenly drops it, and shuns us off in H.M.S. "Sidon" to Ireland in the time of Smith O'Brien. However, we are thankful for small mercies, and even the delicately narrated *précis* of the Sikh War is of very great interest. We hope that this volume is but an *avant courre* of a full life of Viscount Hardinge from the same hand.

The Queen's Commission. By Captain G. T. YOUNGHUSBAND. London: John Murray, 1891. Pp. 254. Size 7 $\frac{1}{4}$ " x 5" x 1". Weight under 1 lb. Price 6s.

The author tells us how to prepare for, obtain, and use Her Majesty's Commission, and gives practical information on the cost and prospects of a military career. The book contains a great deal of valuable and useful information, but on one point

we must offer a caution to parents and guardians. Never rely on publications of this kind for accurate information as regards examinations, whether it concerns age, subjects, or marks. These very important details are all liable to change, and therefore the only safe course in these matters is to obtain the latest orders or circulars issued by the authorities.

The Practice of Navigation and Nautical Astronomy. By HENRY RAPEE, Lieut. R.N. Nineteenth edition. Revised and enlarged by Commander T. HULL, R.N. London: Potter, 1891. Pp. 934. Size 9 $\frac{1}{2}$ " x 6 $\frac{1}{2}$ " x 2". Weight under 3 $\frac{1}{4}$ lbs. Price 16s.

This well-known work has been carefully revised by Commander Hull, Captain Mayes giving his assistance also. Everything referring to the variation of the compass has been re-written. In the tables some changes have been made to bring the book up to date.

Mémoire sur un Nouveau Système de Bouches à Feu démontables. Par PIERRE S. LYCONDIS, Chef de Bataillon du Génie Hellénique. Athènes: Imprimerie Anestis Constantinidès, 1891. Large pamph. Pp. 48.

The author of this work, after offering a short sketch of the construction of various descriptions of screw and other jointed guns, brings forward two designs of his own, for which he claims the special advantage that the tube of the gun is in one piece, since, in place of dividing the gun transversely by a screw joint, he separates it longitudinally by slipping off the jacket from the A-tube.

In his later pattern, which includes the use of wire, he locks the system by means of a ring which clamps a hollow breech-block to the main tube. This block contains the powder chamber; the joint between it and the shot chamber is sealed by a soft metal obturator. The breech is opened by turning the ring, thus releasing the breech-block, which is then drawn to one side. The author shows designs for a 3-inch mountain gun, an 8-inch howitzer, and an 11-inch mortar.

Staff Duties in the Field: a Study of the Operations of a British Army Corps and a Cavalry Division, from the point of view of the General Staff, after the German of Major Cardinal von Widdern's "Das XVI. Armee-Corps und die 7. Kavallerie-Division während ihrer selbständigen Operationen im Mos-Feldzug bei Metz." By Captain J. M. GRIERSON, R.A., D.A.A.-G., Intelligence Division, A.H.Q. Staff. London: Official Publication. Pp. 251. Size 7 $\frac{1}{2}$ " x 5" x 4". Weight under 12 ozs. Price 3s.

Cardinal von Widdern's work follows in the line of Verdy du Vernois' most instructive studies in Troop Leading; and from the standpoint of the Staff describes an imaginary set of operations, lasting about a week, in the neighbourhood of Metz. But in his account he gives plenty of tactical narrative also. Captain Grierson has paraphrased the work, and substituted for the German troops British corps and cavalry division led by Officers bearing British names. Our Officers, whether regimental or Staff, will profit by the perusal and study of the book. The latter knowing, theoretically perhaps, only the details of their work in the field will find here excellent illustrations of theory put into practice; the former will benefit by learning something of Staff work and the difficulties a Staff have to meet and overcome on service. Although, perhaps, we should like to see the British Force on ground within the sphere of its possible activity, yet, as the theatre of operations has been taken out of England, the selection of the ground is very well suited to us, as many Officers now go to Metz to study the battlefields of 1870-71; and two or three days extra can now be most profitably spent, with Captain Grierson's book in hand, in studying and criticizing v. Widdern's operations. There are one or two possible improvements which we venture to suggest for Captain Grierson's consideration when revising the work for the next edition, which it must soon reach: 1. The introduction of an appendix, showing fully in detail the organization of the units employed, length of columns, of trains, &c. 2. Notes showing exactly how the organization of the original differs from our own organization, and the ad-

vantages or disadvantages of each. For instance, the German infantry division is given a whole cavalry regiment, our infantry division but a squadron. 3. There are in the book a large number of references to other works, the Soldier's Pocket-Book, Cavalry Regulations, &c. It would be possible and advisable to substitute in some cases the passage referred to for that reference itself. An Officer of any arm may have at hand the Soldier's Pocket-Book and the Queen's Regulations, but lectures on Staff Duties, Field Artillery Drill, Instructions in Military Engineering, and Cavalry Movements are not always at hand. Her Majesty's Stationery Office do not "push" books they publish, as ordinary publishers do. It is with great pleasure, therefore, that we help in bringing to the notice of the members of the Institution the publication of this very valuable work.

Old England's Navy: An Epic of the Sea. By C. R. LOW. London: Stock, 1891. Pp. 127. Size 7½" x 5" x ¾". Weight under 10 ozs. Price 3s.

"Poeta nascitur, non fit." Ditto, we suppose, the critic of poetry. We are dreadfully prosaic, so for aid we turned to a description of the Epic Poem, and we read that the Epic Poem requires more than any other species of poetry "a grave, equal, and supported dignity." The metre adopted is that of which the first verse serves as an illustration:—

" This to her Majesty the Queen
I dedicate, though some may deem
Me most presumptuous."

When at page 19 we read:—

" He died of wounds, in seventy-two,
Received in his action with Du
Casse, in the West Indies "

—and then looked well into the book, we came to the conclusion that prosaic readers will sum up their ideas of it in one of Mr. Low's own stanzas (page 21):—

" Th'ending was delightful, very,
And inclines one to make merry,
But it points a moral."

Architecture Navale: Théorie du Navire. Par J. POLLARD et A. DUDEBOUT. Tome 11. *Statique du Navire, Dynamique du Navire; Roulis en Milieu Calme, résistant ou non résistant.* Paris: Gauthier-Villars, 1891. Pp. 423. Size 10" x 6½" x 1". Weight under 2 lbs. 2 ozs.

The first volume of this work has already been noticed in this Journal. This is as erudite as the former, and puts forward for discussion several new theories on matters connected with naval architecture.

The Swordsman: A Manual of Fence for the Foil, Sabre, and Bayonet. By A. HUTTON. London: Grevel, 1891. Pp. 126. Size 7½" x 5" x ¾". Weight under 12 ozs. Price 3s. 6d.

Captain Hutton, a well-known authority on all connected with the use of cold steel, has here dealt with another branch of the subject, which he has further explained by many admirably drawn illustrations.

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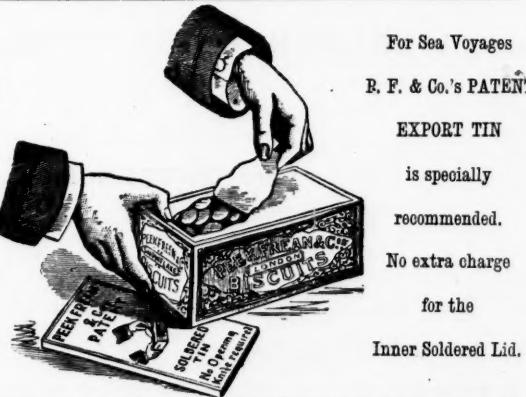
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Note.—For full explanations of these Rules, see the Company's Prospectus.

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